AMERICAN GAS ASSOCIATION

Monthly

APRIL
1950

Save up to $100 now

Standard or de luxe... Gas ranges still cost from $30 to $100 less than comparable ranges run by any other fuel.

NO MATTER HOW MUCH you intend to spend for your new range you're sure to get more for your money if it's run by Gas! For these superb new Gas ranges are not only *years ahead* in modern design . . . but *miles ahead* in speed, ease and cooking results. Yet they're actually *behind in price!* For instance, a 6-burner, 2-oven, 2-broiler, automatic Gas range costs *$100 less* than a 4-burner, twin oven range run by any other modern fuel. And that's not all! Gas saves up to $100 on installation . . . up to $37* on operating costs *every single year!* See the amazing new Gas ranges at your Gas company or appliance dealer's, today!

You get the best for less
THIS TAPPAN "CP" GAS RANGE AND ALL THE OTHER COMPLETELY NEW, COMPLETELY MODERN 1950 GAS RANGES BUILT TO "CP" STANDARDS PROVE AGAIN THAT
GAS has got it!
AMERICAN GAS ASSOCIATION

FASTER THAN THE FASTEST range run by any other fuel! Gas is ready with any heat you want the *second* you want it. Ready to change to dozens of other heats *instantly!*

COOLER THAN THE COOLEST — Boiling—or broiling—Gas keeps the heat *on* the job and *out* of your kitchen. *Burners cool quickly!* Ovens are super-insulated.

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FINER THAN THE FINEST cooking by any other method. And *easier*, too! With Gas you don't have to learn a lot of strange new timing rules or cope with a lot of tricky gadgets.

Save up to $370 in 10 years!*

*Maximum savings of Gas over any other modern cooking fuel . . . based on current Consumer Price Index for 34 key cities . . . as compiled by the U. S. Bureau of Labor Statistics. In 28 out of the 34, Gas costs decidedly less for cooking.

● **Typical advertisement in A. G. A. national advertising campaign on gas cooking which features individually the ranges of nine participating manufacturers**

This month's cover: Several underground constructions made necessary this unusual complex bend in natural gas feeder line of Birmingham Gas Co., Birmingham, Alabama

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COMPLACENCY is an outmoded word in the gas industry. Instead of receiving sitting down exciting news such as record natural gas reserves, gas men everywhere are out on the firing line hitting back hard at the growing pressure of competition. . . . More than 1,400 sales executives throughout the country have been fired with enthusiasm for the Spring Style Show and other promotions on the 1950 A.G.A. sales calendar. . . . Some 19 experts from different geographic regions are pooling their talents to investigate gas production research problems, problems too big, too complicated or too costly to be tackled by individual gas company personnel. . . . Hardhitting campaigns such as the Chattanooga Old Stove Round Up are utilizing every available means to enlist public support. . . . Experiences of 21 representative companies which have undertaken 32 conversions since 1932, and details of a practical supervisory conference series sponsored by The Connecticut Light & Power Company —these are a sample of the helpful information which A.G.A. passes along this month to help the gas business maintain its position in the forefront of American industry.

JAMES M. BEALL
MANAGER, PUBLICATIONS

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EDITOR

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ART SUPERVISOR

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CONTENTS FOR APRIL 1950

FEATURES

GAS RESERVES CONTINUE UPSWING 3
GAS PRODUCTION RESEARCH IN 1950—by E. G. Boyer 7
SPRING STYLE SHOW 10
MIDDLE-MAN FOR MANAGEMENT—by C. J. Allen 14
ECONOMICS OF GAS CONVERSIONS 17
ANNUAL REPORTS SHOW GAS PROGRESS 19
CHATTANOOGA ROUNDS UP "101 WILD WEST SHOW"—by W. A. Hudson 21

SECTIONS

TAX IMPACT ON PUBLIC UTILITIES—by C. E. Eble 23
A. G. A. COMMERCIAL GAS SCHOOL OFFERS REFRESHER AND ADVANCED TRAINING 26
PRODUCTION PROGRAM ANNOUNCED 28
AUTOMATIC GAS CLOTHES DRYER—CURE FOR A LIFE AT HARD LABOR—by D. C. McDermand 30
GAS INDUSTRY STANDARDS ADOPTED 33

DEPARTMENTS

INDUSTRIAL RELATIONS ROUND-TABLE 9
INDUSTRY NEWS 34
PERSONAL AND OTHERWISE 40
ASSOCIATED ORGANIZATION ACTIVITIES 42
OBITUARY 43
CONVENTION CALENDAR 47
PERSONNEL SERVICE 48

THE MONTHLY IS INDEXED BY THE INDUSTRIAL ARTS INDEX

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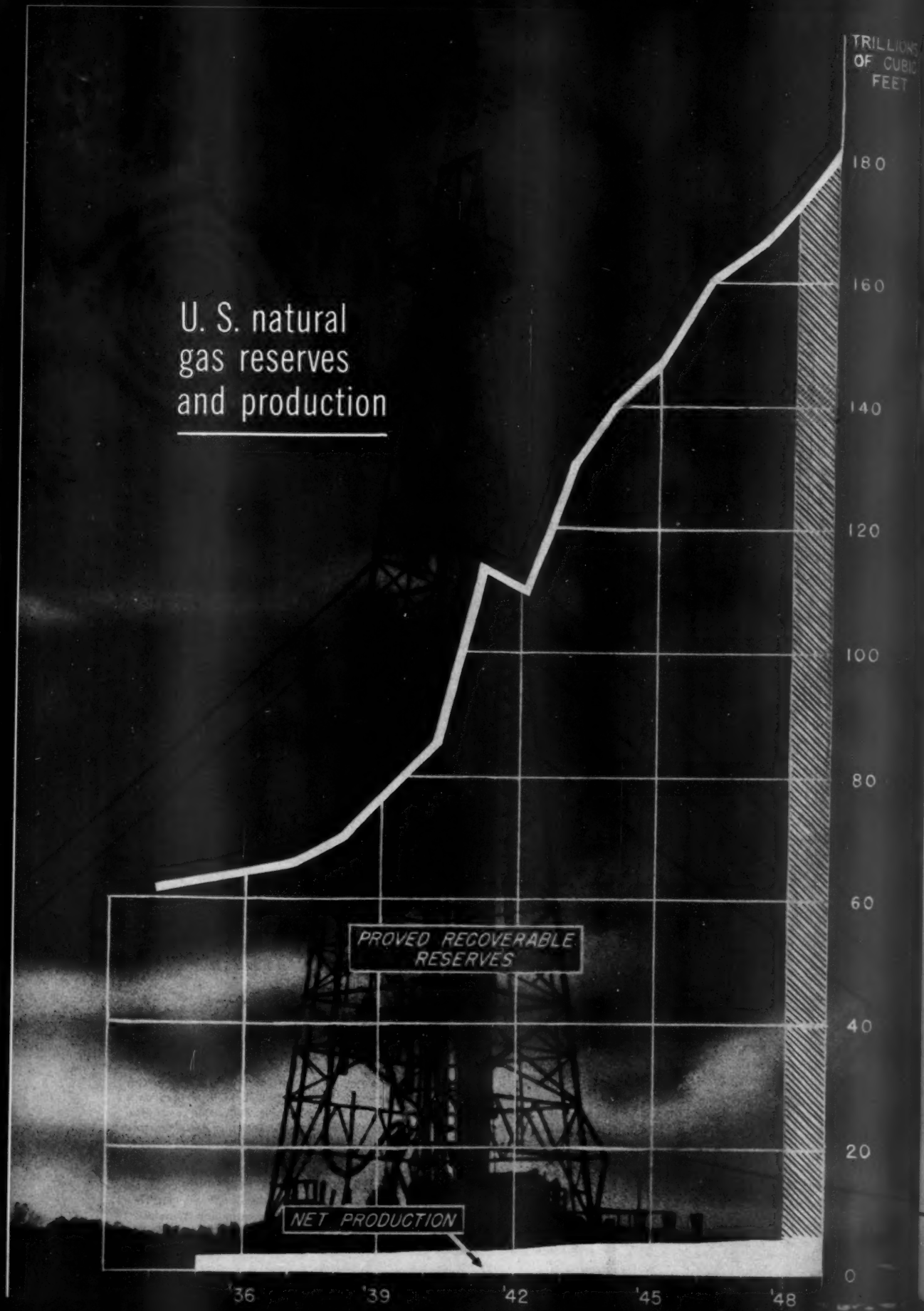

U. S. natural
gas reserves
and production
TRILLIONS OF CUBIC FEET
180
160
140
120
100
80
60
40
20
0
PROVED RECOVERABLE RESERVES
NET PRODUCTION
'36
'39
'42
'45
'48

Gas reserves continue upswing

Basic strength of the nation's natural gas industry was proved again last month in a joint report of the Committees on Reserves of American Gas Association and American Petroleum Institute. Leading experts serving on the two groups estimated proved recoverable reserves of natural gas and liquid hydrocarbons in the U.S. on December 31, 1949 at record new highs of 180.3 trillion cubic feet and 28.38 billion barrels, respectively. Proved recoverable reserves of natural gas at the end of 1948 were 173.87 trillion cubic feet and total liquid hydrocarbon reserves were 26.82 billion barrels.

Proved recoverable natural gas liquid reserves at the end of December 1949 were 3.73 barrels compared with 3.54 billion barrels a year earlier. Discoveries of new natural gas reserves in 1949 added 4.61 trillion cubic feet to the 1948 reserves. At the same time, extensions and revisions of previous estimates of reserves in existing fields amounted to 8.06 trillion cubic feet. For the second year in a row, the total of new discoveries, revisions and extensions more than doubled the estimated net production of natural gas. As a result, the net increase in natural gas reserves during 1949 (6.51 trillion cubic feet) was greater than the estimated net production of natural gas during the year (6.24 trillion cubic feet). The net production was also an increase over the 6.01 trillion cubic feet of natural gas produced in 1948.

Also significant is the fact that estimated reserves of gas in underground storage were 82.7 billion cubic feet greater than on December 31, 1948. This indicates the increasing attention which the gas industry is devoting to economic patterns of consumption. The increase is due also in part to the relatively mild winter which the country as a whole experienced in the last quarter of 1949.

Strong evidence of the decrease in flaring natural gas and the effectiveness of the natural gas industry's conservation programs was provided in the new report. Despite the opening of considerable mileage of new pipelines and a substantial increase in natural gas consumption during 1949, total production for the year increased less than 240 billion cubic feet over 1948.

This was the fourth in a series of joint yearly reports by the two committees marking a new method of estimating the nation's petroleum sources. The latest estimate of proved natural gas reserves is 19.8 trillion cubic feet greater than the estimate made when the committees released their first report in 1946.

The A.G.A. committee also noted the increasing interest and importance of Canadian reserves. A suggestion was

A. G. A. Committee on Natural Gas Reserves checking latest figures: (Seated, left to right) George H. Smith, A. G. A.; William Burke, Dallas; Otto E. Zwanzig, A. G. A.; Perry Olcott, Houston; N. C. McGowen, Shreveport, committee chairman; Frederick S. Lott, Bureau of Mines; Len Thawley, Midland, Texas; C. C. Hoffman, Oklahoma City; (standing) J. R. Arrington and C. C. Ingram, Tulsa; J. T. Scopes, Shreveport; F. H. Finn, Pittsburgh; R. O. Garrett, Shreveport. Other members represented were: R. M. Bauer, Los Angeles, Calif.; E. A. Brown, Dallas; W. S. McCabe, Casper, Wyo.; L. H. Meltzer, Shreveport, La.; T. E. Roth, Pittsburgh; Henry Toler, Jackson, Miss.; C. E. Turner, Bartlesville, Okla.

NATURAL GAS RESERVES

	(THOUSANDS OF CUBIC FEET)	
Total proved reserves as of December 31, 1948		173,869,340,000
Extensions and revisions of previous estimate	8,061,429,000	
New reserves discovered in 1949	4,612,870,000	
Net changes in "stored gas" during 1949	82,746,000	
Total proved reserves added and net changes in "stored gas" during 1949		12,757,045,000
Total proved reserves as of December 31, 1948 and additions during 1949		186,626,385,000
Deduct production during 1949		6,245,041,000
Total proved reserves of natural gas as of December 31, 1949		180,381,344,000

NATURAL GAS LIQUIDS RESERVES

	(BARRELS OF 42 U. S. GALLONS)	
Total proved reserves as of December 31, 1948		3,540,783,000
Extensions and revisions of previous estimate	294,211,000	
New reserves discovered in 1949	92,565,000	
Total proved reserves added in 1949		386,776,000
Total proved reserves as of December 31, 1948 and new proved reserves added in 1949		3,927,559,000
Deduct production during 1949		198,547,000
Total proved reserves of natural gas liquids as of December 31, 1949		3,729,012,000

Imagine 180,381,344,000,000 cubic feet of natural gas! That is the figure established by the A. G. A. Committee on Natural Gas Reserves. Perry Olcott (left), Houston, and C. C. Hoffman, Oklahoma City, are shown above during the committee meeting in Colorado Springs, Colo., February 20-22

made to the Association's Executive Board regarding the possibility of having comparable annual estimates prepared of proved recoverable reserves of natural gas and natural gas liquids by a corresponding Canadian group.

N. C. McGowen, who has headed the A.G.A. Committee on Natural Gas Reserves since its formation in October 1945, is a former president and director of American Gas Association. During World War II, he served as a member of the Petroleum Industry War Council and was chairman, Natural Gas and Gasoline Committee for district three (Petroleum Industry Committee appointed by the Petroleum Administrator for War). Mr. McGowen has completed 36 years of service with United Gas Pipe Line Co., Shreveport, La., of which he is president.

Groups of prominent experts have been appointed by Mr. McGowen to serve as chairmen of subcommittees to estimate reserves in ten natural gas producing regions. These chairmen serve as members of the A.G.A. Committee on Natural Gas Reserves, which is composed as follows:

R. M. Bauer, Southern California Gas Co., Los Angeles, Calif.; E. A. Brown, Lone Star Gas Co., Dallas, Texas; R. O. Garrett, Arkansas Louisiana Gas Co., Shreveport, La.; Charles C. Hoffman, Cities Service Gas Co., Oklahoma City, Okla.; Frederick S. Lott, Bureau of Mines; W. S. McCabe, Stanolind Oil and Gas Co., Casper, Wyo.; L. H. Meltzer, Union Producing Co., Shreveport, La.; Perry Olcott, Humble Oil and Refining Co., Houston, Texas; E. E. Roth, Columbia Engineering Corp., New York, N. Y.; J. T. Scopes, Union Producing Co.; Henry Toler, Southern Natural Gas Co., Birmingham, Ala.; C. E. Turner, Phillips Petroleum Co., Bartlesville, Oklahoma. George H. Smith and O. E. Zwanzig, A.G.A., are committee secretary and assistant secretary, respectively.

The API Committee on Petroleum Reserves is headed by F. H. Lahee, Sun Oil Co., Dallas. Committee members are as follows: D. V. Carter, Magnolia Petroleum Co., Dallas, vice-chairman; Fred Van Covern, API, secretary; R. F. Baker, The Texas Co., New York, N. Y.; Frank R. Clark, The Ohio Oil Co., Tulsa, Okla.; Morgan J. Davis, Humble Oil & Refining Co., Houston, Texas; Alexander Deussen, consulting geologist, Houston; Graham B. Moody,

Standard Oil Co. of California, San Francisco, Calif.; J. M. Sands, Phillips Petroleum Co., Bartlesville, Okla.; P. R. Schultz, Stanolind Oil & Gas Co., Tulsa, Okla., and Theron Wasson, The Pure Oil Co., Chicago, Illinois.

In view of the importance of the joint reports, the MONTHLY has reprinted them below.

A.G.A. committee reports

The American Gas Association Committee on Natural Gas Reserves submits its fifth annual report, summarizing the proved recoverable reserves of natural gas and natural gas liquids of the United States, as of December 31, 1949.

Reserves data are shown by states in Table 1 and Table 2.

Table 3 is a summary of the committee's annual estimates of proved natural gas reserves for the past five years, reflecting changes in the natural gas reserve position in the United States during each of the four years since December 31, 1945. Table 4 shows the proved natural gas liquids reserves of the United States for the last four years and the changes which have taken place in these reserves annually since the first estimate was made as of December 31, 1946.

The committee has continued the practice begun last year of reporting the volume of gas in storage in underground reservoirs. The "stored gas" is considered to be the gas which has been transferred from its original location in a gas and/or oil field to another natural underground reservoir for the primary purposes of conservation, fuller utilization of pipeline capacities and more effective delivery to markets. The "stored gas" reserve is the quantity placed in a natural reservoir and not yet removed. Any additional recoverable gas which may have been in the underground storage reservoirs when injection was begun and has not yet been produced is classified and listed in its proper category. Withdrawals from storage are included in the figures shown under the heading "Net Change in Underground Storage." This is distinguished from "net production" which refers to gas removed from a producing reservoir.

The committee points out again that it is often not possible to estimate the total reserves of a field in the year of its discovery. Satisfactory estimates can be made only after there has been sufficient drilling in the field and, in some cases, adequate production history. For these reasons, the reserves listed as discovered during any current year must be considered only as the reserves indicated by the drilling in that year. Estimated reserves of the new fields and pools will be revised in future reports and shown as "Extensions and Revisions."

Procedures followed in estimating and assembling the proved reserve figures were the same as those used in past reports. These reserves may be in either the drilled or undrilled portion of a given field. Where the undrilled areas are considered proved, they are so related to the developed acreage and to the known field geology and structure that their productive ability is considered assured. Proved recoverable reserves of natural gas are the reserves estimated to be producible under present operating practices. Since the estimates are

TABLE 1 ESTIMATED PROVED RECOVERABLE RESERVES OF NATURAL GAS IN THE UNITED STATES

(MILLIONS OF CUBIC FEET—14.65 PSIA, AT 60 DEG F)

	CHANGES IN RESERVES DURING 1949[b]					RESERVES AS OF DECEMBER 31, 1949[b]				
	RESERVES AS OF DEC. 31, 1948	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Net Change In Underground Storage[c]	Net Production[d]	TOTAL (Columns 7 + 8 + 9 + 10, also Columns 1 + 2 + 3 + 4 less Column 5)	Non-Associated[e]	Associated[f]	Dissolved[g]	Underground Storage[h]
ARKANSAS	901,838	27,739	3,783	15	59,185	874,190	438,861	161,224	272,645	1,460
CALIFORNIA	10,192,593	151,526	187,899	3,105	543,488	9,991,635	2,773,105	2,357,637	4,845,763	15,130
COLORADO	1,349,179	(—)102,384	5,128	0	24,828	1,227,095	580,442	33,603	613,050	0
ILLINOIS	227,804	29,378	16,140	0	40,130	233,192	5,692	15,000	212,500	0
INDIANA	21,600	5,890	3,960	0	6,250	25,200	5,000	0	20,200	0
KANSAS	14,407,832	(—) 8,123	10,855	2,279	323,283	14,089,560	13,702,217	127,988	230,206	29,149
KENTUCKY	1,378,151	50,381	8,400	2,465	90,000	1,349,397	1,270,903	0	66,000	12,494
LOUISIANA	23,977,520	2,238,587	1,277,430	0	805,726	26,687,811	20,954,929	4,135,685	1,597,197	0
MICHIGAN	182,987	39,514	3,836	6,165	17,438	214,911	145,642	0	47,495	21,774
MISSISSIPPI	2,504,336	81,499	12,084	0	68,950	2,528,969	1,764,540	415,030	349,399	0
MONTANA	852,605	(—) 16,646	4,021	1,416	37,925	803,471	767,051	6,088	27,341	2,991
NEW MEXICO	5,606,361	737,698	146,287	7,363	256,706	6,241,003	3,137,497	2,252,569	839,734	11,203
NEW YORK	67,615	225	0	2,545	3,700	66,685	56,310	0	660	9,715
OHIO	629,453	42,264	9,225	18,629	47,000	652,571	549,097	0	36,500	66,974
OKLAHOMA	11,332,445	606,335	251,012	3,522	567,335	11,625,979	7,873,220	969,132	2,767,508	16,119
PENNSYLVANIA	617,410	48,148	8,700	17,422	70,000	621,680	520,069	0	43,250	58,361
TEXAS	95,708,553	3,963,647	2,521,917	0	3,023,714	99,170,403	68,579,797	16,959,726	13,630,880	0
UTAH	69,798	1,754	338	0	6,313	65,577	65,269	0	308	0
WEST VIRGINIA	1,737,167	116,372	24,500	17,194	180,000	1,715,233	1,587,107	0	85,500	42,626
WYOMING	2,093,740	43,692	107,958	626	72,339	2,173,677	1,328,615	148,290	696,298	474
MISCELLANEOUS[a]	10,353	3,933	9,550	0	731	23,105	12,141	6,700	4,264	0
TOTAL	173,869,340	8,061,429	4,612,870	82,746	6,245,041	180,381,344	126,117,504	27,588,672	26,386,698	288,470

[a] Includes Alabama, Florida, Missouri, Nebraska, Virginia and Maryland.
[b] Excludes gas loss due to natural gas liquids recovery.
[c] The net difference between gas stored in and gas withdrawn from underground storage reservoirs.
[d] Net production equals gross withdrawals less gas injected into underground reservoirs; changes in underground storage are excluded. December production estimated occasionally.
[e] Non-associated gas is free gas not in contact with crude oil in the reservoirs.
[f] Associated gas is free gas in contact with crude oil in the reservoirs.
[g] Dissolved gas is gas in solution with crude oil in the reservoirs.
[h] Gas held in underground reservoirs for storage purposes only.

made by fields, the recovery factor or abandonment pressures used in the calculations were governed by the operating conditions in each individual field. Proved recoverable reserves of natural gas liquids are those contained in recoverable gas reserves.

For purposes of developing these estimates, natural gas liquids are defined as those hydrocarbon liquids that are gaseous in the reservoir but are obtainable by condensation or absorption. Natural gasoline, condensate, and liquefied petroleum gases fall in this category. In order to prevent misunderstanding of this term it is further amplified as follows: Natural gas liquids are those heavier hydrocarbon components of the natural gas which are removed and reduced to the liquid state by various processes. These processes usually take place in the field separator, scrubber, gasoline plant, or cycling plant. The liquids so collected and the products made from them in some of the modern plants are known by a variety of names, but they have been grouped together here under the general heading "natural gas liquids."

The estimates presented in this fifth annual report incorporate the results of careful study of many hundreds of fields and pools throughout the United States. Their preparation has required the help and active cooperation of specially trained geologists and engineers familiar with the many producing areas throughout the country. The committee is fortunate in the help it has received from this group of men who have served as subcommittee members. They have given generously of their time and effort to make these estimates as complete and accurate as possible.

API committee reports

As will be recalled, beginning with the report for December 31, 1946, the estimates presented on proved liquid hydrocarbon reserves were expanded to include not only crude oil, but also all classes of natural gas liquids. The figures on crude oil were prepared by the API Committee, and the figures on natural gas liquids were prepared by the A.G.A. Committee in cooperation with the API Committee. For the present report, the same procedure has been followed.

As of December 31, 1949, the committee estimates that the proved reserves of crude oil in the United States amounted to 24,649,489,000 barrels. The natural gas liquids totaled 3,729,012,000 barrels, making a grand total of 28,378,501,000 barrels.

Estimates in this report, as in all previous annual reports of this committee, refer solely to proved or blocked-out reserves. They include only oil and natural gas liquids recoverable under existing economic and operating conditions.

The estimates made for this report do not include:

(1) Oil* under the unproved portions of partly developed fields.

(2) Oil in untested prospects.

(3) Oil that may be present in unknown prospects in regions believed to be generally favorable.

(4) Oil that may become available by secondary-recovery methods from fields where such methods have not yet been applied.

(5) Oil that may become available through chemical processing of natural gas.

(6) Oil that can be made from oil shale, coal, or other substitute sources.

Proved reserves are both drilled and undrilled. The proved drilled reserves,

(Continued on page 44)

* The word "Oil" unless defined as crude oil, is used in this report as essentially equivalent to liquid hydrocarbons.

TABLE 2 ESTIMATED PROVED RECOVERABLE RESERVES OF NATURAL GAS LIQUIDS* IN THE UNITED STATES

(THOUSANDS OF BARRELS OF 42 U. S. GALLONS)

	RESERVES AS OF DEC. 31, 1948	CHANGES IN RESERVES DURING 1949				RESERVES AS OF DECEMBER 31, 1949		
		Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Net Production	TOTAL (Columns 6 + 7 + 8, also Columns 1 + 2 + 3 Less Column 4)	Non-Associated	Associated	Dissolved
ARKANSAS	57,457	1,149	128	3,092	55,642	35,338	7,865	12,439
CALIFORNIA	307,908	29,996	9,560	27,189	320,275	0	108,564	211,711
COLORADO	36,299	(—) 5,307	25	6,827	24,190	906	0	23,284
ILLINOIS	24,162	6,238	81	3,815	26,666	28	75	26,563
INDIANA	108	29	20	31	126	25	0	101
KANSAS	102,344	6,573	113	2,625	106,405	102,612	1,491	2,302
KENTUCKY	14,401	315	157	1,628	13,245	13,245	0	0
LOUISIANA	524,096	81,174	17,821	26,669	596,422	447,929	99,122	49,371
MICHIGAN	1,066	238	18	119	1,203	728	0	475
MISSISSIPPI	57,564	1,440	101	2,698	56,407	24,173	25,945	6,289
MONTANA	4,000	(—) 80	20	230	3,710	3,545	30	135
NEW MEXICO	80,247	9,152	736	4,416	85,719	24,523	38,889	22,307
OHIO	1,664	119	13	126	1,670	1,670[b]	0	0
OKLAHOMA	200,388	43,062	7,952	17,372	234,030	103,063	21,900	109,067
PENNSYLVANIA	2,645	158	79	239	2,643	2,643[b]	0	0
TEXAS	2,074,674	110,442	54,794	96,199	2,143,711	1,303,100	323,898	516,713
UTAH	209	7	2	10	208	206	0	2
WEST VIRGINIA	15,214	1,107	369	3,859	12,831	12,831[b]	0	0
WYOMING	36,307	8,416	540	1,400	43,863	28,055	2,979	12,829
MISCELLANEOUS[c]	30	(—) 17	36	3	46	0	33	13
TOTAL	3,540,783	294,211	92,565	198,547	3,729,012	2,104,620	630,791	993,601

[a] Includes condensate, natural gasoline and liquefied petroleum gas.
[b] Not allocated by types, but occurring principally in column shown.
[c] Includes Alabama, Florida, Missouri, Nebraska, New York, Virginia and Maryland.

A.G.A. sponsored study of catalysts for gaseous reactions

Gas production research in 1950

By E. G. BOYER

Chairman, Gas Production Research Committee, American Gas Association

a PAR activity

Before discussing our work for the present year it would not be amiss to indicate the organization of the Gas Production Research Committee and to outline our general research policy.

The Gas Production Research Committee is one of the four main research divisions operating under the PAR Plan, and is supervised by the General Research Planning Committee. It is composed of 19 executives taken from the highest production level, and geographically speaking, covers the country quite well. It is aided by a Technical Advisory Committee whose membership is drawn from the technical men of the industry.

It may be said that "research" is an overused word—even its meaning is not clear to all. Every minor investigation does not deserve this title. Most of the difficulties arising in an operating company are local and can be resolved by the technical staff of that company. In some instances, of course, the experience of other companies is helpful, or the services of a consultant may be necessary. However, many of the topics suggested for research are highly localized engineering problems and as such really are not suitable for industry-supported research.

As we see it, the proper function of the Gas Production Research Committee is to investigate problems of general industrywide interest—problems which are too big, too complicated, or too costly to be undertaken by individual gas company personnel who normally are fully engaged in maintaining gas supplies and services. Therefore most of our research work is fairly long-term, requires relatively large and complicated apparatus and from two to perhaps five years for completion.

Another point to remember is that all of the research projects selected cannot be of equal value to every company in an industry whose operating units have such varied production facilities and requirements. However, every project is screened from the viewpoint of its practical usefulness to a substantial segment of the gas industry. This screening is done first by the originating committee and then is reviewed by the General Research Planning Committee.

Activities of the Gas Production Research Committee continue to be twofold: One type consists of collection, discussion and dissemination of existing knowledge and experience; the other comprises the initiation and prosecution of active research to fit the needs of the industry, present and future.

In connection with these activities, every possible source of information is tapped: literature studies, personal contacts, surveys and orientation studies are combined to develop the background information required by the committee as an aid to its decisions. Meetings have been arranged with manufacturers of equipment on several occasions to acquaint them with our research developments, to get their viewpoint, and to enlist their interest. Some manufacturers have been most cooperative in furnishing the committee with detailed studies relating to their own special process equipment and developments.

In the committee's opinion the major problem of the industry, both natural and manufactured gas, is still the problem of peak load. The acquisition of natural gas supplies in manufactured gas areas, whether for partial use or 100 percent conversion eventually results in more acute peaks, due largely to the increase in the space heating load. Attempted

Mr. Boyer is chairman, gas department, Philadelphia Electric Co., Philadelphia, Pennsylvania.

A.G.A. gas production research projects

No.	Title	Agency
CPR-5B	Reactions Carbon-Oxygen-Steam	Institute of Gas Technology
CPR-7	Catalysts	Institute of Gas Technology
CPR-17	Fluidized Gasification	Institute of Gas Technology
CPR-23	Oil Gasification	Institute of Gas Technology
CPR-24	Pressure Gasification	Institute of Gas Technology
CPR-25	Organic Sulphur Removal	Institute of Gas Technology
PB-1	Coal Carbonization	Institute of Gas Technology
PB-2	Spray Cooling & Scrubbing	Institute of Gas Technology
BMI-1	Water Gas Reaction	Battelle Memorial Institute
TL-1	Mixed Gas Research	A.G.A. Laboratories
HB-1	Hall High Btu Oil Gas	Consolidated of Baltimore
PG-1	Oxygen Blown Producer	U. S. Bureau of Mines
PDC-3	Combustion Fundamentals	U. S. Bureau of Mines
NBS-1	Carburetted Water Gas Analysis	National Bureau of Standards
PB-4	Natural Gas Sulfur Survey	Institute of Gas Technology
PB-6	Interchangeability of Oil & Natural Gases	Institute of Gas Technology
PE-5	Methanation Catalyst	Surface Combustion Corporation

restriction of the sale of space heating units is not a final answer to this problem because the public demand for a premium heating fuel means that restrictions will only delay matters—that is, the eventual peak load will be reached in a greater number of smaller increments. The end result will be the same.

The size and importance of the peak load problem may be illustrated by pointing out that in localities where 100 percent natural gas has been in use for a number of years, and where a high saturation of space heating exists, the summer base load to winter peak may be in the ratio of 1 to 8 or 1 to 10.

There are four important approaches to the peak load problem. First, develop larger base loads or off peak gas sales. This approach is outside the Gas Production Research Committee's normal sphere of activity but is of major interest to its members. Second approach is gas storage underground, high pressure, liquefaction, etc. Third, the interchangeability of substitute gases; and fourth, the improvement of production processes and the development of new ones. While the peak load aspects are paramount, naturally base load factor problems are also included in our program.

The committee has given much study to storage of natural and manufactured gas but currently is not conducting any research project in this field. Possibilities of underground storage of natural gas are determined by purely local geological conditions and present no new research problems of a general or industrywide character. In connection with liquid storage, one company was invited to present its engineering plans and estimates for a complete liquid storage plant of moderate size. A new process for liquid storage employing solid absorbents is being followed. Suggestions regarding possible storage of heat on the consumers' premises have also been discussed and tabled for future consideration.

In the field of production processes the committee has kept an open mind, both as to the kind of fuels and the types of

A.G.A. Gas Production Research Committee

E. G. Boyer, chairman—manager, gas department, Philadelphia Electric Co., Philadelphia, Pa.

N. K. Chaney*, secretary—American Gas Association

T. L. Robey*, coordinator—American Gas Association

J. F. Bell—vice-president, Portland Gas & Coke Co., Portland, Ore.

D. S. Bittinger—general superintendent, Washington Gas Light Co., Washington, D. C.

C. R. Breck—engineer, c/o Southern Natural Gas Corp., New York, N. Y.

P. T. Dashiell—consultant, United Engineers & Constructors, Inc., Philadelphia, Pa.

L. J. Eck—vice-president and assistant general manager, Minneapolis Gas Co., Minneapolis, Minn.

H. E. Ferguson—plant testing engineer, The Peoples Gas Light & Coke Co., Chicago, Ill.

Samuel Green—assistant chief engineer, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Edwin L. Hall, conferee member—director, A.G.A. Laboratories, Cleveland, Ohio

H. M. Henry—vice-president, NEGEA Service Corp., Cambridge, Mass.

R. J. Horn—manager gas operations, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

R. E. Kruger—superintendent gas operations, Rochester Gas & Electric Corp., Rochester, N. Y.

Grove Lawrence—assistant to vice-president, Southern California Gas Co., Los Angeles, Calif.

F. J. Pfluke*—superintendent gas manufacture, Rochester Gas & Electric Corp., Rochester, N. Y.

E. S. Pettyjohn, conferee member—director, Institute of Gas Technology, Chicago, Ill.

R. H. Philipps, Jr.—general manager gas department, Public Service Electric & Gas Co., Newark, N. J.

S. S. Tomkins—chemical engineer, Consolidated Edison Co. of New York, Inc., New York, N. Y.

Dr. F. E. Vandaveer—director of laboratories, The East Ohio Gas Co., Cleveland, Ohio

J. H. Wolfe—general superintendent gas operations, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.

*Ex officio member

processes. This is shown by the list of projects now under study. Although the present trend is away from solid fuels, nevertheless these still constitute the great bulk of our total energy resources and cannot be ignored in any long range program.

Among these gasification projects may be mentioned the gasification of powdered coal in suspension using oxygen for the continuous production of blue gas. The building of an oxygen plant could be considered only for base load production. But the possible availability of oxygen in the future as a delivered commodity may also permit peak load applications. This type of process would provide a gas suitable for enrichment by oil gas or natural gas. It would also provide a source of gas for the synthetic production of methane as a natural gas substitute, or for the synthesis of liquid fuels. This gasification project is now in the pilot plant stage.

Another solid fuel project contemplates the use of oxygen or oxygen-enriched air with the finer sizes of coke. If this proves feasible the process will permit the utilization of a low-cost fuel —possibly in existing types of apparatus —to make an ideal gas for blending purposes. This project is being conducted in cooperation with the Bureau of Mines at Louisiana, Missouri.

In the field of liquid fuel, the Hall High Btu Process was developed as a means of utilizing a wider range of residual oils with increased efficiency. Still other methods are being investigated. One of these is the fluidized bed process for the continuous production of oil gas which would be capable of using still heavier high carbon oils. It has the potential advantages of continuous operation, more *(Continued on page 39)*

Industrial relations round-table

Prepared by
A. G. A. Personnel Committee

● **Employee attitudes**—By the considered diagnosis of Chicago's Dr. Robert M. McMurry, disputes between labor and management are not so much social or political problems as psychological conflicts. Recently after ten years' work with 180,000 employees of 127 companies, he summed up his findings: "Management has failed to be the kindly protective father, so the union has become the caressing mother who gets things from that stinker of a father."

In nearly all of the 127 plants studied, Dr. McMurry and his staff found that the worker was frustrated, made to feel like an "inferior creature, a number in a department." The indignities of the factory caste system, he declares, crush the worker's ego—"The time clock is a beautiful symbol of servitude." Workers are constantly galled by rules which assign them to dining rooms and toilets inferior to the bosses', and leave them to scramble for space in the parking lot where stalls are reserved for executives.

Workers kept assuring Dr. McMurry and associates that they joined unions to win tangible benefits, e.g., higher pay and greater job security. After thousands of interviews, the psychologists concluded that the men's real, unconscious motive was a craving to improve the emotional situation surrounding their jobs.

About five percent of all workers, Dr. McMurry believes, are chronic malcontents and one percent are paranoids. He says that such workers join unions to vent their unresolved, aggressive impulses upon management. He believes that union leaders fall into three main groups: (1) sincere idealists; (2) emotionally immature neurotics who tend to be exhibitionists; (3) psychopathic personalities who regard labor as a racket.

Psychologist McMurry thinks that management should have a personnel department, which uses psychological techniques in hiring workers and keeping them happy. One important way: providing a channel for opinion to flow from workers to management. Opinion, he says, is like water—it flows easily downhill, but it takes a lot of pressure to pump it up. Modern workers get a cataract of managerial opinion in bulletins and house organs, but only a thin dribble of their opinion is forced up to management.

In telling management about its faults, Dr. McMurry admits that he has to pull his psychological punches. Otherwise, he says, "We would lose our jobs." For management is also emotionally immature, and when given bitter pills of truth, it suffers anxieties and guilt feelings which it is apt to take out on the bearer of the bad news.

● **Educational opportunities**—During 1949 over 7,750 employees of Pacific Gas & Electric Company enrolled in courses covering almost any subject desired. The educational program was inaugurated to provide employees the opportunity for continuing their education. A record is maintained in the personnel department of all courses that have been completed by an employee.

The educational program is under the supervision of the general educational committee which directs the program, establishes policies and coordinates the educational activities of the various sections. There is an educational committee in each division of the company and one in the general construction department.

Courses offered fall into major fields such as, accounting, air conditioning, calculating machines, economics, electricity, gas, first aid, estimating, English, home economy, public speaking, salesmanship, mathematics, steam, traffic and safety, welding, and many others. For a complete description of this amazing program write to: L. J. Nevraumont, manager personnel department, Pacific Gas & Electric Company, 245 Market Street, San Francisco 6, California.

● **All personnel** workers are interested in things that will help them to do their jobs better. "More results at less cost in personnel administration" is the title of an address made before the October session of California Personnel Management Association by Guy B. Arthur, Jr., president, Management Evaluation Services, Inc. of Toccoa, Georgia. Mr. Arthur reviews the fundamentals of personnel management and shows where many employers have fallen short and tells why unions have been successful in many of their aims.

There is proof, he says, that workers want more than money from their jobs and it is in this that many employers have shortchanged themselves in their relation with their own workers. Mr. Arthur goes on to say "the basic job of personnel administration is consultative. Personnel executives should be designing policies for management approval. They should be evaluating policies, reviewing current practices and making recommendations for improvements toward the end of more results and lower operating costs."

The ultimate burden of personnel administration belongs on the line organization, according to Mr. Arthur, and he shows why and how it is done in many successful companies today. Copies of the address may be obtained for $1.00 from California Personnel Management Association, 870 Market Street, San Francisco 2, California.

● **Of interest** to the personnel field is the article appearing in the January 1950 issue of *Factory Management and Maintenance* entitled "Will Your Old-Timers Be Ready To Retire?" Written by Dr. George Lawton, a consulting psychologist, who specializes in counseling men and women of middle age, the article should be helpful as well as interesting to personnel representatives of companies who are becoming interested in the increasingly popular subject of preparing workers for retirement. Included are

(Continued on page 16)

Spring Style Show

Accent on style—Frank C. Smith, center, chairman of Houston meeting, flanked by Frank W. Williams and John J. Bourke, A.G.A. speakers

a PAR activity

Approximately 1,400 sales executives of gas utility companies have completed nine regional meetings through the U.S. and Canada outlining the most ambitious sales promotion program ever undertaken by the American Gas Association. Primary theme of the meetings was the "Spring Style Show" campaign which has been organized to increase sales of automatic gas ranges in the first half of 1950.

The year 1950 marks the first time that the gas industry has been presented with a specific promotion on each appliance and a complete year-round promotional schedule. Delegates to the different meetings received detailed accounts of these individual and over-all sales campaigns which call for expenditures of more than $25 million by American Gas Association, Gas Appliance Manufacturers Association, gas utility companies, gas appliance manufacturers and gas appliance dealers.

Members of the Association's Promotion Bureau described the A. G. A. sales promotion calendar which charts the complete year's program. During 1950 A. G. A. will spend nearly $800,000 in national advertising establishing a theme which the coordinated utilities of the industry will carry on in newspapers, direct mail and other advertising media.

Speakers on the different regional programs pointed out that nationally, gas company sales personnel today is less than half what it was during the prewar period. Many companies have less than 20 percent of the number of retail salesmen they had in 1940. The industry as a whole has the largest number of customers in its history but the smallest number of salesmen. The 1950 unified sales promotion program is designed to help remedy this situation and to supply the industry with new momentum in its sales efforts.

The regional sales meetings were sponsored by the A. G. A. Residential Gas Section. Joint sponsorship of five meetings was shared with New England Gas Association, Southern Gas Association, Pacific Coast Gas Association and Canadian Gas Association.

Starting off the parade of regional gatherings, some 200 sales executives gathered in Los Angeles on February 15 under the sponsorship of Pacific Coast Gas Association. Frank N. Seitz, general supervisor of sales promotion, Southern California Gas Company, presided as chairman.

J. J. Quinn, vice-president, Boston Consolidated Gas Co., presided over approximately 100 sales executives at the Copley Plaza hotel in Boston on February 20. Mr. Quinn is currently chairman, A. G. A. National Advertising Committee.

On the same day, approximately 265 delegates met for a similar regional meeting at the Sheraton Hotel in St. Louis, Missouri. R. J. Vandagriff, general sales manager, Laclede Gas Co., served as chairman. On February 21 Irving K. Peck, vice-president, The

"Sell 'em comfort" with gas house heating, J. L. Campbell, New Orleans Public Service Inc., told his audience at the SGA-A.G.A. Houston meeting

Stage setting of a window display sponsored by PCGA which will be duplicated on April 10 in 1000 gas appliance dealer windows from the Mexican border to Vancouver in British Columbia

New York style show wins smiles of approval from, left to right: H. Leigh Whitelaw, GAMA; H. Carl Wolf, A.G.A.; Hugh H. Cuthrell, A.G.A. president and meeting chairman; and R. A. Malony, Bridgeport

J. K. Knighton, Servel, Inc., presenting a graphic picture of "What's Ahead for Gas Refrigeration"

Modern gas refrigerators lead the style parade, W. K. Grube, Servel, Inc., declared at Houston

Miss Spring Style Show "dressing up" Clifford Johnstone for the PCGA Los Angeles meeting

Irving K. Peck, center, Pittsburgh chairman, shown with Norval Jennings and Cliff Hall, of A.G.A.

New York keynoters. Left to right: S. C. Gorman, director, GAMA water heater drive; W. J. Schmidt, Mineola; F. W. Williams, A.G.A.; H. P. Morehouse, chairman, A.G.A. Residential Gas Section

Manufacturers Light & Heat Co., presided over more than 100 delegates at the Hotel William Penn in Pittsburgh.

First of the regional meetings under the joint sponsorship of A. G. A. and SGA was held at the Rice Hotel in Houston, Texas, on February 22. Frank C. Smith, president, Houston Natural Gas Corp., and chairman, A. G. A. General Promotional Planning Committee, served as chairman. The promotional spotlight then moved to the Schroeder Hotel in Milwaukee, Wisc., on February 23. Approximately 100 delegates gathered under the chairmanship of B. T. Franck, vice-president, Milwaukee Gas Light Company.

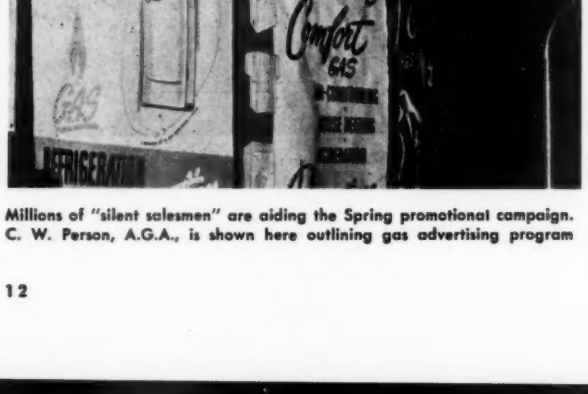
On February 27, Hugh H. Cuthrell, president, American Gas Association and vice-president, The Brooklyn Union Gas Co., called more than 200 delegates to order at the Hotel Statler in New York. The second meeting sponsored by Southern Gas Association was staged in Birmingham, Ala., at the Hotel Tutweiler on March 2. Carl H. Horne, vice-chairman, A. G. A. Residential Gas Section and vice-president, Alabama Gas Corp., was chairman of the meeting. Approximately 100 sales executives participated.

Canadian gas men prepared to tie-in with the 1950 program during a special joint meeting held in Toronto, Canada on March 20. Approximately 250 executives gathered under the chairmanship of E. C. Phillips, Consumers' Gas Co. of Toronto.

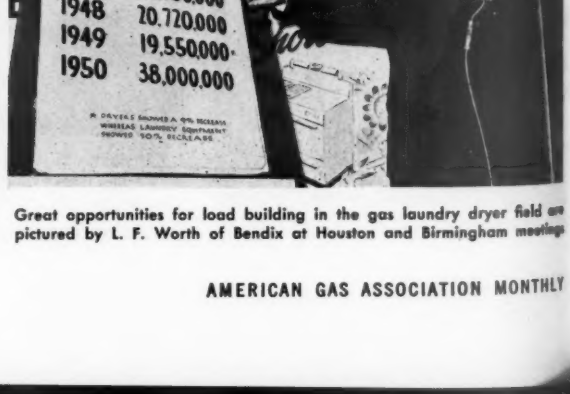
Feature attraction of each meeting was a comprehensive outline showing plans of A. G. A. and GAMA range manufacturers for the Spring Style Show. Starting in April 1950 this gigantic promotion on automatic gas ranges will capitalize on the appeal of new styles and trends to women. A colorful portfolio has been prepared by A. G. A. Promotion Bureau in the form of a complete "How To Do It" brochure.

Other speakers at the regional meetings told of efforts of GAMA to enroll more than 35,000 gas appliance dealers throughout the nation in the Style Show campaign. Leading range manufacturers have designated one model of their new lines as the Spring Style Show model. Manufacturers are planning to support the drive with advertising, sales and promotion efforts.

Members of the A. G. A. Promotion Bureau showed the sales executives how to assemble a store or window display using the material offered in the portfolio. Aluminumware and other prize contest material to stimulate sales was exhibited. *(Continued on page 13)*



Millions of "silent salesmen" are aiding the Spring promotional campaign. C. W. Person, A.G.A., is shown here outlining gas advertising program



Great opportunities for load building in the gas laundry dryer field are pictured by L. F. Worth of Bendix at Houston and Birmingham meetings

Each meeting featured a special Spring Style Show with models from local stores showing new style trends in women's clothing. Each model demonstrated a feature of a modern gas range. They proved that automatic clock control and completely automatic features of the new 1950 gas ranges enable the housewife to play tennis, visit the beach or attend a bridge party while meals are cooking.

Other speakers emphasized that the gas industry is determined to retain its extensive leadership in the water heating field. Sales executives were encouraged to back up the Court of Flame campaign being carried on by GAMA and A. G. A. to stimulate sales of automatic gas water heaters.

"Profit Unlimited" was the theme of talks devoted to promotion of the automatic gas laundry dryer. Speakers emphasized the extensive profit opportunities which this new gas appliance offers to utility companies and dealers throughout the country.

Another important domestic servant, the gas refrigerator, was described by representatives of Servel, Inc., Evansville, Indiana. Delegates learned of the tremendous promotional efforts which this company and A. G. A. are making to sell "fifty percent more in nineteen-fifty."

Regional delegates also learned firsthand of the large market ready for all-year gas air conditioning. Speakers advised the delegates to "sell 'em comfort" with gas house heating.

The program of each regional meeting was designed to show the delegates the reasons behind the promotional periods featured in the 1950 promotional calendar. Each campaign is based on the results of a sales and promotional survey in which all gas company members of the Association were requested to tell A. G. A. what periods during the year they place major or minor sales and promotional emphasis on various domestic gas appliances at the local level. Thus the over-all sales calendar is built on a utility advertising and sales platform patterned after the needs of the industry. Each campaign is scheduled to allow considerable latitude and adjustment by individual companies.

With more than 1,400 top sales executives thoroughly indoctrinated in the 1950 promotion calendar the gas industry is expected to attain a new peak in sales momentum.

Humor and drama characterize the Milwaukee show which Chairman B. T. Franck is opening

L. L. Baxter, president, Southern Gas Association, speaking at the Houston Style Show

Pointers on selling the "fifth big job," air conditioning, are given by H. C. Pierce, Servel

Harold Massey, GAMA, in New York, pointing out advantages of aggressive house heating promotion

Gas range manufacturers' tie-in efforts being explained in Milwaukee by Pierre Vinet, Rockford

"All Aboard" for GAMA gas water heater promotion drive, A. G. Bur tells Milwaukee listeners

D. C. McDermand, Hamilton Mfg. Co., describing "profits unlimited in sales of gas clothes dryers"

Comfort and gas house heating are synonymous, K. B. Lucas, Minneapolis, points out with a smile

Company supervisors learn technique of conference leadership. Widespread discussion was stimulated and one-man domination of meetings discouraged

Middle-man for management

By C. J. ALLEN

Vice-President
The Connecticut Light & Power Co.
Waterbury, Conn.

Once in awhile," the foreman said, "when the big boss has something special to put over, they call us supervisors together and tell us we're part of management and let us in on what's going on, but often as not I find out what's new in our outfit by reading the papers. If we're really part of management, then I shouldn't have to get the news of important goings-on from the newspapers or the company grapevine. And if I have to get much of my information that way, then someone should tell the boss to stop telling me I'm part of management."

The writer recently listened to just such an expression from a foreman in one of Connecticut's large industrial plants which has had its full share of employee relations problems. Of course it's not practicable to tell supervisors in advance all about proposed plans and policies because neither they nor we would have time left for our regular duties. But getting supervisors to believe that they are a real part of management cannot be accomplished until the supervisor himself becomes convinced that top management in his company really means what it says when it tells him he's a member of the management team. And that's a full-time job for management.

Many companies are doing a splendid job in this direction and it is no part of this writer's notion to claim that the far from large Connecticut Light and Power Company is doing an outstanding job in this field. But because our president, R. H. Knowlton, became so interested in the important problem of convincing our supervisors they were on his management team our company organized a Supervisors Conference series which we and our supervisors think is really paying off. Others in the gas industry who haven't gotten around to this problem yet may be interested in how we are doing it.

We have 350 supervisors ranging from managers and department heads all the way down to line foremen. With a few exceptions at the very top, all our supervisors are included in the conference program. The conferences are deliberately planned to avoid the lecture form of presentation, which so many times is pedantic in nature, sophomoric in content, and chiefly interesting to the lecturer himself. Instead, the conferences are an informational process based on the *combined* supervisory experience of the group in attendance. They bring to bear on common problems the best thinking and discussion of the entire group.

In a properly run supervisory conference there is no lecturer. Instead there is a conference leader whose only function is to guide the discussion of the group towards the solution of the problem being discussed. The atmosphere of the conference is informal and everyone present speaks freely, agreeing or disagreeing as he sees fit. So far as possible the administration of the plan is kept on the local level. Each company division and department appoints its own committee composed of one supervisor who acts as chairman and four associate supervisors who serve with him.

System-wide coordination is effected by a central coordinating committee made up of the chairman of each local committee, together with our supervisor of employee information and training.

Mr. Allen is currently serving as vice-chairman, Publicity and Advertising Committee, American Gas Association. The accompanying article is the first of a series sponsored by the committee and written especially for the A. G. A. MONTHLY.

Joseph R. Maher, who came to us with a background of experience in the field of employee information and training.

Each local committee is responsible for the vitality of its own conference program, for arranging meetings, selecting the subject matter for four of the eight scheduled conferences, and arranging presentation aids and discussion outlines. The local committee is also responsible for keeping records of conference recommendations. The central committee, with Mr. Maher's guidance, is responsible for the administration of the program as a whole. It is responsible for the selection of subject matter for four of the eight scheduled conferences (the other four being selected locally) and for arranging all supplementary aids required for presenting the conferences. This general or central committee is also responsible for editing and following up such local conference recommendations as are of system-wide interest.

Selection of conference leaders—Leaders were selected by the manager or department head after careful consideration of the special qualifications of each of his supervisory group. This is most important and the writer hopes he won't be ejected from the national vice-presidents' union when he says that proper qualifications for conference leadership are not necessarily a part of a Vee Pee's equipment. Speaking plainly, some otherwise excellent executives or other supervisors are deficient in the qualities of inspirational leadership or in some instances find it difficult to avoid lecturing or dominating the conferences. This last is a near-fatal weakness in a conference leader.

Training of conference leaders—We held a four-day, full-time institute on conference leadership at which Schuyler Spalding, a veteran staff member of the Board of Education of the State of Connecticut instructed the leaders in the techniques of conference leadership. Here again Mr. Spalding, whose services have been made available to Connecticut industry by the State Board of Education, emphasized both in theory and practice the technique of encouraging full participation by all the group in the discussions and conclusions and in the avoidance of the lecturing form of presentation. His lengthy experience with other companies in this field was easily recognizable by the supervisors. From the start, wide discussion was stimulated and one-man domination of the meetings discouraged.

How large should these conference groups be? No less than ten members and no more than 20. Supervisors included in any particular conference group should represent different departments, thus assuring different viewpoints and diversified knowledge.

How was the program inaugurated?

A. A memorandum was sent to the division managers and department heads explaining the program and defining its objectives.

B. Managers and department heads then appointed

(a) One representative to the central coordinating committee who will also act as chairman of the local committee.

(b) Four supervisors to act as local committee members under the chairmanship of the person mentioned above.

(c) One or more conference leaders, depending on the number of groups in the division or department.

A few of the subjects considered:

(a) Basic responsibilities of a supervisor.

(b) How our employees can help to make our public relations program work.

(c) Introducing the new employee to his job.

(d) How best to increase employee and customer awareness of the threat of governmental intrusion into business.

(e) Suggestions for keeping all our employees better informed.

(f) The supervisor and our safety program.

(g) Natural gas and its accompanying problems.

It should be noted again that on these and other subjects the conferees will have full opportunity to express opinions, ask questions and exchange information. A recommended solution of the problem considered is agreed upon by the conference. This then follows the procedure set up to insure that all suggestions and recommendations are given full consideration by management and either adopted or the reasons why they cannot or should not be adopted explained in detail to the supervisors.

Space does not permit a more complete explanation, but two important aids to the success of the activity should be mentioned. The first is the special Supervisors Information Service mailed to the home of each supervisor about three times each month. Second is the assignment of 11 top management representatives, including our president, vice-presidents and top department heads, to attend a stated number of special evening meetings to discuss informally with the supervisory groups problems of general company interest. Our regular conferences are held during working hours but these special meetings are usually held after hours, on company property. Re-

Conference leaders listening to a runback of a wire recording of their own performance at the conference training institute. Rapt attention of the listeners was characteristic of the interest shown

freshments are served and the supervisors meet and chat with top management in a highly informal but, we hope, constructively interesting manner.

These special meetings were not part of our original plan. They were arranged after the plan had been working some time and in response to the comment of many of the conference groups that they normally saw little of Mr. Knowlton and others of the so-called "brass." They inquired why arrangements couldn't be made to meet these folks and talk with them about the company and its problems. At these meetings the staff head chats about his specialty (accounting, finance, operating, sales, public relations, etc.) and invites and answers questions concerning company practices or policies which any supervisor wishes to raise.

To illustrate, at a recent meeting Paul Fleming, our financial vice-president who modestly disclaims any proficiency as a speechmaker, talked to our Waterbury group chattily and informally about our financial condition and prospects. He explained in simple, layman's language the difference between common and preferred stocks, bonds, debentures and other financial terms and units which ordinarily are little understood by many supervisors. He answered numerous questions asked by interested supervisors and made a genuine hit with a group of Waterbury supervisors who in the course of their day-to-day business would rarely see Mr. Fleming whose headquarters are in Hartford.

How's it going? The writer is sincerely convinced that this activity is doing much to convince our important supervisors that we really mean it when we tell them they are management. Some supervisors regarded the idea with understandable skepticism at first but a number of them since have gone voluntarily to their department heads, to Mr. Maher and other top supervisors, to tell them they'd been won over to the conviction that these conferences are really "on the level" and indicate that our management fully intends to work closely with our supervisors.

There is, of course, nothing new in what we're doing. It's been done before and I have no doubt much better by other companies. But, again, to those companies that haven't tried it, we recommend the Supervisory Conference and Information Plan as one way for top management to improve its relations with its highly important supervisory group. We're trying it and we like it. Even more important, our supervisors tell us they like it too.

Industrial relations

(Continued from page 9)

discussions of such subjects as (1) getting used to the idea of retiring, (2) early planning, (3) reducing your budget and (4) expanding your interests. Dr. Lawton has made use of many brief case histories to illustrate the points which he believes to be of great importance in consideration of the subject—planning for retirement.

● **Professor Sumner H. Slichter** of Harvard University recently proposed that federal social security be modified by (1) raising the pension eligibility age from 65 to 70 years, (2) extending coverage to 25 million more persons, and (3) increasing benefits to one-half the pensioner's average annual earnings. Professor Slichter believes that only a government plan "would make adequate pensions universal and . . . provide pensions without building up an enormously large and hard-to-invest reserve against accrued liability." He estimates that a federal program of the scope he proposes would cost 8 to 13 percent of payrolls, which should be borne by both employers and employees.

● **All dressed up**—Newest and smartest-looking four-page employment application is devised by the Port of New York Authority. All questions are neatly laid out and typography clear and large enough for applicants to read easily. Layout encourages neatness. Write to: John D. Foster, personnel director, Port of New York Authority, 111 Eighth Avenue, New York, N. Y.

The bottom of these application blanks contains the following good-will message: "Thank you for completing this application form and for your interest in employment with us. We would like to assure you that your opportunity for employment with the Port of New York Authority will be based only on your merit and on no other considerations."

● **Vitalizing the Foreman's Role in Management** by Glenn Gardiner and Robert L. Gardiner. McGraw-Hill Book Company, Inc., New York, 1949. 274 pages. $3.50.

Every top executive or anyone in the organization responsible for building teamwork would profit by a careful study of the principles, factors, and sequence evolved by these two hard-hitting, practical authors.

● **"Pension Plans"** is the title of an additional chapter of "Collective Bargaining Provisions" being published serially in mimeographed form by the Bureau of Labor Statistics, U. S. Department of Labor. This chapter on pension plans is 140 mimeographed pages and deals with specimen plans, typical rules for eligibility and other features.

● **A four-page** printed leaflet has been issued by industrial relations section, California Institute of Technology, listing about 30 references to publications on Industrial Relations. It is available from the Institute at Pasadena 4, California without charge.

● **How many days a year** do rest periods amount to? One researcher with an inquiring mind found that two ten-minute rest periods a day add up to ten workdays a year of lost time per employee.

● **What does your company do** when it asks a prospective employee from another city to call for an interview? Does it pay expenses? The Associated Industries of Cleveland made a check of 21 companies and came up with these interesting results: 11 pay all expenses; nine do not pay travel expenses; one pays transportation only one way if employee is not hired.

● **General Motors** has introduced a "Help Yourself" program as a channel for communications with its employees. Information racks have been installed at various plant and office locations to hold supplies of miscellaneous booklets having educational value or other interest to employees. The plan is described in *Iron Age* for January 12, 1950.

● **Food for thought**—Does your company operate a cafeteria in the plant? If so you might have to bargain with the union about the prices you charge. The NLRB has just decided that under the Taft-Hartley Act an employer is obligated to negotiate menu prices in company dining rooms provided no other eatery is easily accessible. Similar situation (although it hasn't come up yet) is where employees have a half hour for lunch and must eat in plant cafeteria because they haven't time to go a block or so to the local diner.

● **Interest test**—Southern New England Telephone Company does not hand out its annual report indiscriminately. Instead it runs a picture preview of its contents in the company house organ. Then, on the bottom of the page is an "Order Form" for employees to write for a free copy of the annual statement.

A. G. A. survey of 32 representative changeovers reveals some interesting trends

Economics of gas conversions

What happens to gas sales, revenues, income and rates when utility companies change the type of gas distributed to customers? What are some of the problems and solutions to be expected? How valuable is the experience of converted companies to other gas utilities which are contemplating changes such as the advent of natural gas?

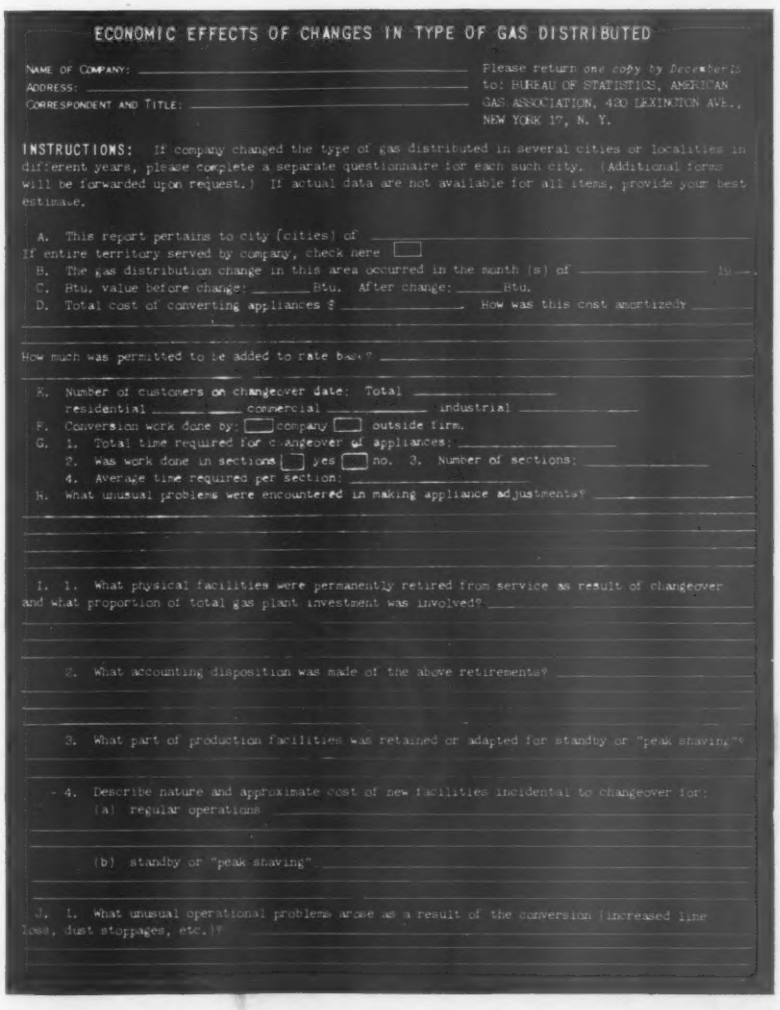
Practical information on these and other timely questions is supplied by an American Gas Association survey of 21 representative companies throughout the country which have undertaken 32 conversions since 1932. Among other significant facts, the survey indicates a rapid improvement in the financial status of companies which have converted to distribution of natural gas. In most cases this improvement was accomplished through substantially increased sales volumes rather than through rate increases.

The study covers specific conversion projects, some of which affected entire companies and others only parts of service areas. Conversions which were surveyed involved groups ranging from less than a thousand to over 375,000 customers. Most numerous of these case studies have been the changeovers from the distribution of manufactured gas to that of natural gas—25 conversions in all. Next in order of frequency were the four changeovers from mixed to natural gas. In addition, two instances of conversion from manufactured to liquefied petroleum gas and one from manufactured to mixed gas are included in the survey.

Individual replies are available at the Bureau of Statistics at Association headquarters for analysis by member gas companies. A. G. A. Bureau of Statistics is prepared to make photostatic copies of any or all of the survey replies at cost upon request by any member gas company.

Even though individual experiences are of greatest benefit to gas companies contemplating conversions, the composite experience of the companies included in the study shows interesting and sometimes astounding trends.

Only one of the companies covered in this survey specifically indicated that it had been permitted to add the conversion costs to the rate base. Where such costs were relatively small they were frequently charged to the current year's operations. This occurred in ten cases. More generally, the companies amortized their conversion costs over a



ECONOMIC EFFECTS OF CHANGES IN TYPE OF GAS DISTRIBUTED

NAME OF COMPANY: _____
ADDRESS: _____
CORRESPONDENT AND TITLE: _____

Please return one copy by December 15 to: BUREAU OF STATISTICS, AMERICAN GAS ASSOCIATION, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

INSTRUCTIONS: If company changed the type of gas distributed in several cities or localities in different years, please complete a separate questionnaire for each such city. (Additional forms will be forwarded upon request.) If actual data are not available for all items, provide your best estimate.

A. This report pertains to city (cities) of _____
If entire territory served by company, check here ☐
B. The gas distribution change in this area occurred in the month (s) of _____ 19__.
C. Btu. value before change: _____Btu. After change: _____Btu.
D. Total cost of converting appliances $ _____ How was this cost amortized? _____
How much was permitted to be added to rate base? _____

E. Number of customers on changeover date: Total _____
residential _____ commercial _____ industrial _____
F. Conversion work done by: ☐ company ☐ outside firm.
G. 1. Total time required for changeover of appliances: _____
2. Was work done in sections? ☐ yes ☐ no. 3. Number of sections: _____
4. Average time required per section: _____
H. What unusual problems were encountered in making appliance adjustments? _____

I. 1. What physical facilities were permanently retired from service as result of changeover and what proportion of total gas plant investment was involved? _____

2. What accounting disposition was made of the above retirements? _____

3. What part of production facilities was retained or adapted for standby or "peak shaving"? _____

4. Describe nature and approximate cost of new facilities incidental to changeover for:
(a) regular operations _____

(b) standby or "peak shaving" _____

J. 1. What unusual operational problems arose as a result of the conversion (increased line loss, dust stoppages, etc.)? _____

Front of questionnaire showing some of the information required in recent American Gas Association survey of representative companies throughout the country which have undertaken gas conversions

SIGNIFICANT CHANGEOVER TRENDS
MANUFACTURED GAS TO NATURAL GAS

(Last Complete Year Prior to Conversion = 100)

	Pre-War (1932-1941)			Period of Conversion War Time (1942-1945)			Post-War (1946-1949)	
Number of conversions included	12			7			6	
Total customers at time of conversion	603,800			162,700			317,700	
				Years After Conversion				
	1	2	5	1	2	5	1	2
Customers								
Total residential	105	109	123	113	119	138	110	111
Residential house heating	1,240	1,470	4,900	173	737	5,470	911	1,390
Sales (Therms)								
Residential	164	187	256	124	151	372	173	186
Commercial	243	312	493	n.a.	n.a.	n.a.	168	197
Industrial	957	1,650	2,190	n.a.	n.a.	n.a.	253	889
Revenues								
Residential	98	104	127	113	126	203	124	135
Commercial	113	137	201	n.a.	n.a.	n.a.	118	137
Industrial	224	312	408	n.a.	n.a.	n.a.	133	282
Operating expenses (excluding taxes and depreciation)	124	134	155	124	139	254	112	119
Gas utility income	119	114	176	n.a.	n.a.	n.a.	133	137
Maximum daily sendout								
Mcf	162	213	274	96	136	262	134	135
Therms	305	401	516	176	249	480	241	269
Prices								
10 Therms	81	76	73	92	92	83	86	92
30 Therms	68	65	62	75	75	71	80	84
100 Therms	55	53	49	66	66	53	71	72

SIGNIFICANT POST-WAR CHANGEOVER TRENDS
MIXED GAS TO NATURAL GAS

(Last Complete Year Prior to Conversion = 100)

Period of Conversion 1946-1949

Number of Conversions Included	4	
Total Customers at Time of Conversion	318,200	
	Years After Conversion	
	1	2
Customers		
Total residential	105	108
Residential House heating	158	189
Sales (therms)		
Residential	150	168
Commercial	187	221
Industrial	252	356
Revenues		
Residential	127	138
Commercial	152	171
Industrial	168	229
Operating expenses (excluding taxes and depreciation)	137	172
Gas utility income	117	124
Maximum daily sendout		
Mcf	129	186
Therms	164	222
Prices		
10 Therms	99	97
30 Therms	95	93
100 Therms	91	89

period varying from two to 13 years. Ten years was the most frequent period. Twenty-four conversions were carried out by the companies themselves, while in eight cases the work was performed by outside contractors.

Cost per customer naturally can be expected to vary with the type of conversion. The greater the change in the heat content of the gas being distributed, the more substantial the appliance adjustments and therefore the greater the cost. There are of course other factors which affected this customer conversion cost, including some which lend themselves to analysis. Other factors cannot be analyzed because of the lack of data. Among the latter are variations in major appliance saturation at the time of changeover, and the relative proportions of domestic, commercial and industrial appliances.

The period when the conversion occurred also affected the costs—prewar changes invariably were less expensive than those occurring during and since the war. Thus the prewar manufactured to natural gas conversion costs averaged $5.41 per customer as compared with $12.28 per customer for similar conversions during and since the war. All of the conversions from mixed to natural gas included in this survey have occurred since the end of the war, at an average conversion cost of $7.64 per customer.

Many of the companies reported no serious operational problems as a result of their changeovers. Among the issues which were most frequently cited, however, were dust problems in regulators and appliances, particularly pilots; drying out of meter diaphragms and pipe joints with ensuing meter inaccuracies and increased leakage.

Total revenues showed average gains of 47 percent over the course of five years for companies converting from manufactured gas in the prewar period. For postwar conversions, gains of 38 and 44 percent have been indicated over the course of two years for changes from manufactured and mixed gas, respectively.

Gas utility income referred to in the tables on page 18 was computed after deductions of taxes, depreciation and conversion amortization for the year.

These and other salient trends are shown in the accompanying tables.

While these tabulations may be the most spectacu- *(Continued on page 45)*

Annual reports show gas progress

• The company annual report is an ever-more important element of the over-all business scene. Following are notes from a number of reports which depict the fundamental strength and growth of the nation's gas utility industry. **Excerpts from additional gas company annual reports will appear in later issues of the Monthly.**

Providence Gas Co., Providence, Rhode Island—The company has an unbroken record of dividends for 101 consecutive years. According to New York Curb Exchange, this is the longest record of any stock traded on that exchange.

At the beginning of 1949 the company had more house heating and commercial heating customers than ever before and added more throughout the year than in any previous 12 months. Nevertheless, the adverse effect of warm weather resulted in approximately a 12 percent decrease of gas sales for these purposes.

Texas Gas Transmission Corp., Owensboro, Kentucky—A $73,500,000 pipeline construction project has been substantially completed within original cost estimates. The company's new facilities are designed to lift total daily delivery capacity to over 600 million cubic feet of natural gas a day. Gas sales last year were higher than any previous year.

The Columbia Gas System, Inc., New York, New York—Gas sales in 1949 reached an all-time high. Twelve times during the past winter the system exceeded the highest daily sendout in its history. The annual report notes an ability to deliver more than two billion cubic feet of gas in a single day.

Gas supply grew to the point where authorized contracts with pipeline companies called for firm delivery of 782,500,000 cubic feet of Southwestern gas a day. Substantially all of this quantity is due to be received by the end of 1950. Since incorporation in 1926 the system's common stock holders have grown in number from 19,513 to 71,297.

The Brooklyn Union Gas Co., Brooklyn, N. Y.—Operating revenues in the company's centennial year were the highest in its history. Merchandising operations resulted in a new gas appliance sales record of $5,700,000 for 1949, one and a half times the figure attained in the best prewar year.

Net additions to plant and equipment amounting to $2,635,000 virtually completed the company's $25 million postwar expansion program. Construction was started on a pipeline to carry natural gas to Brooklyn Union's manufacturing plants. First natural gas is expected to be received by the company in November 1950.

The Peoples Gas Light and Coke Co., Chicago, Ill.—A 1,000-mile dual integrated natural gas system has widened the company's scope of business. Plans for obtaining a new and additional supply of natural gas through construction and operation of a third pipeline are being pushed. Studies indicate that Chicago and other areas supplied by the company will require the impressive total of about one billion cubic feet of natural gas daily by the winter heating season 1956-1957.

In spite of aggressive promotion by competitors, the gas company maintained and even strengthened the promotion of gas appliances in the residential field. Approximately 96 percent of the kitchen ranges in use in Chicago are gas. The Peoples Gas Light and Coke Company was recently cited by Servel, Inc., for having sold more gas refrigerators during the year than any other utility in the country. Plumber-dealers and the gas company set new records in the sale of automatic gas water heaters during 1948 and 1949.

Washington Gas Light Co., Washington, D. C.—Gas sales of $19,177,000 were the largest in the company's history and about five percent greater than in the previous year. Adequate supplies of natural gas are now available to the system. More gas-equipped homes are under construction or planned in the service area than ever before. More than 14,300 new house heating accounts were added to the lines. The latter figure includes 4,800 customers who changed to gas heat from other fuels.

Texas Eastern Transmission Corp., Shreveport, Louisiana—A new construction program was undertaken to increase daily delivery capacity of the system to 740 million cubic feet daily. The Big Inch system transported 161.8 billion cubic feet of natural gas in 1949, an increase of 37 percent over 1948. In connection with its proposal to serve New Eng- *(Continued on page 22)*

JAYCEES OFFER WESTERN SHOW

Naming of a "frontier days" queen will be a high light of the celebration which will be sponsored by the Junior Chamber of Commerce at Warner Park Oct. 6 through 9, with the famous 101 Ranch Wild West Show performing nightly Thursday through Sunday and on Saturday and Sunday afternoons, Bill Hagan, Jaycee president, announced.

Finley W. Iboire, chairman of the

PREVIEW PLANNED OF 'FRONTIER DAYS'

Dinner, Entertainment Set Tuesday for Officials, Radio, Press Men

A western preview of the Jaycee-sponsored "Frontier Days" to be held at Warner Park Oct. 6 through Oct. 9, for the benefit of Jaycee civic welfare fund, will take place at the Chattanooga Gas Company Tuesday night at 6 o'clock. The Jaycees, 101 Ranch Wild West Show management and the Chattanooga Gas Company will play hosts to city officials, members of the radio and press at a real western roundup buffalo meat dinner.

A side dish of Texas rattlesnake meat will also be featured for those who desire it.

Coffee in tin cups and all the trimmings served by a real ranch roundup cook, music and songs by a cowboy band, and all the personnel of the gas company's old stove roundup, in range attire, will present a western atmosphere to staid

'DON'T SHOOT, BOYS!' Mayor Hugh Wasson tells Finley Wilhoite (right), general chairman, and Ambrose Locke, Jaycee vice-president, who "held up" the city's chief executive for a proclamation of city observance of the "Frontier Days" celebration which the Junior Chamber of Commerce sponsors Oct. 6-9. Featured event in the 101 Ranch Wild West Show at Warner Park, with six performances, [illegible] the boys to put away their six-guns and [illegible] celebration.—(Staff Photo by Sherrill.)

Wasson Sets Oct. 6-9 as 'Frontier Days'

All Chattanoogans have been urged by Mayor Hugh Wasson to join in the festive "Frontier Days" celebration which the Junior Chamber of Commerce will sponsor Oct. 6 through 9 at Warner Park with the 101 Ranch Wild West Show as the featured event.

Chattanoo

FRONTIER QUEEN—Bette Gae Shull, daughter of [illegible] Shull, has been chosen Frontier Days queen [illegible] of the performances of the 101 Ranch Wild West [illegible] Park, Oct. 6-9. "Texas" Jack Hoover is pointed

OLD STOVE ROUND UP

OFFICIALS EAT 'FRONTIER DAYS' CHOW

City Commissioners Roy Hyatt and P. R. Olgiati, County Judge Wilkes T. Thrasher and Chief of Police Ed Ricketts get helpings of buffalo meat and rattlesnake sauce from Miss Ruth Forrester and Miss Grace Morris at the dinner served at Chattanooga Gas Company last night by the Junior Chamber of Commerce and 101 Ranch. The dinner was a promotion for the "Frontier Days" Wild West Show here tomorrow through Sunday. The gas company is busy with a roundup of its own now, offering a prize for the oldest gas stove brought in to the company.—Times Staff Photo by Ben Ray.

'FRONTIER DAYS' CHOW LINE—Junior Chamber of Commerce, Chattanooga Gas Company and 101 Ranch Wild West show were joint hosts Tuesday night to a press-radio-officials preview party of the Jaycee-sponsored "Frontier Days" celebration Oct. 6-9 at Warner Park. Shown in the chow line Shull, daughter of the gas company's "chuck house" receiving generous helpings of roast buffalo (with a dash of rattlesnake sauce on the side) are Mayor Hugh Wasson, Frontier Days Queen Bette Gae Shull, [illegible] Mrs. V. F. Shull, Dr. Shull, James A. O'Dell of the gas company. Serving is Miss Ruth Forester, [illegible] John's Restaurant prepared the buffalo meat. The Hartman Brothers furnished western music. [illegible] "Frontier Days" opens Thursday at 2:30 p.m. with a street parade. Riding lead horses will be Queen Bette Gae and Jaycee Parade Marshal Jack Hoover, and the 101 Ranch performers and riders will [illegible] be featured.—(Staff Photos by Bill Truex.)

GAS COMPANY COWHANDS—Chattanooga Gas Company has a "natural" tie-in with the Jaycee-sponsored "Frontier Days" celebration Oct. 6-9. The local company has joined the natural gas industry in the revival of "Old Stove Round-up" and is engaged in a large-scale promotional campaign for bringing in old gas ranges. Employees of the company are dressed in cowboy attire, and corrals

JC WILD WEST SHOW TONIGHT

101 Ranch to Perform 'Rain or Shine'

Opening performance of the famous 101 Ranch Wild West Show, feature attraction of the Jaycee-sponsored "Frontier Days" celebration, will begin at Warner Park tonight at 8 o'clock "rain or shine," Cherokee Hammons, the 101's general manager, announced early this afternoon.

Only a heavy downpour would force cancellation of tonight's show, he said. Performances will be given nightly through Sunday, with matinees scheduled Saturday and Sunday at 2:30 p.m. An estimated 2,000 worthy children will see the Saturday matinee as guests of the 101 and the Jaycees.

Jaycees and show officials early this afternoon were still debating whether to hold the parade at 2:30 opening the "Frontier Days" events. Queen [illegible]

PARADE INTRODUCES JAYCEE WILD WEST SH

"Texas Jack" Hoover of the Junior Chamber of Commerce is shown as he led the [illegible] down Market Street yesterday afternoon. There were cowgirls, cowboys, Indians [illegible] marching units in the [illegible]

Gas company's tie-in drive a model for local Old Stove Round Up promotions

oounds Up "101 Wild West Show"

By W. A. HUDSON

Sales Manager
Chattanooga Gas Company
Chattanooga, Tennessee

By August 1949 we had laid plans for beginning our first postwar Old Stove Round Up on September 26. Ranges were ordered, cowboy hats and boots were ordered, the sales contest was worked out, and the advertising was having the finishing touches applied. Yet we were wondering how to stage a parade on the downtown streets? It sounded like a good promotional idea, but we just didn't see how we alone could stage a successful parade.

Shortly after, we noticed a news article in the daily newspaper on September 8, announcing that "Jaycees Offer Western Show." The story said that the Junior Chamber of Commerce would sponsor a "frontier days" event presenting the famous 101 Ranch Wild West Show. The celebration called for selection of a "queen" from local talent and a big afternoon parade downtown.

This was our chance—a big wild west promotion to be staged during the second week of our Old Stove Round Up! What a *natural* for a tie-in!

Immediately we got busy and sold some ideas to the president of the Junior Chamber of Commerce and their publicity chairman. Then we made a date to see the publicity director of the Wild West Show when he came to town during the next few days. The combination of Junior Chamber of Commerce, Wild West Show and gas company formulated plans and secured three full weeks of advance publicity which made head-lines in both daily newspapers. Reproduced at left is about one-third of the total advance publicity on the Wild West Show.

Climax of all this publicity was a grand downtown parade which included local socialites and public officials, as well as the complete troupe from the Wild West Show with a covered wagon drawn by eight oxen. Of course, Chattanooga Gas Company was represented by a large float advertising the Old Stove Round Up and the free gas range to be given away.

Naturally, the three organizations (Jaycees, Wild West Show, and Gas Company) wanted to show their appreciation to all the public officials, newspapers, radio stations, and others, for their wonderful assistance in helping to promote the show. Therefore, we invited about 50 representatives from these local organizations to be our guests at a "buffalo meat supper" on the sales floor of the gas company the evening prior to the day of the big parade.

The gas company's home service department served "chow" from a chuck house on the sales floor. Included on the menu were buffalo meat, baked beans, vegetable salad, corn bread, potato chips, coffee in tin cups, and a side dish of Texas rattle snake meat.

Heading the guests were the county judge, mayor, city commissioners, chief of police, fire chief, fire marshal, editors of both daily newspapers, managers of five local radio stations, and a representative from the state legislature. Thirty-five pounds of buffalo meat and all of the rattle snake meat were consumed.

Results of our Old Stove Round Up were quite successful—the company exceeded its quota by 18 percent. We heartily recommend to all gas companies a tie-in with the 101 Ranch Wild West Show if it plays in your city during Old Stove Round Up time.

Group of guests eating buffalo meat served from chuck house on the sales floor of Chattanooga Gas Company. Celebrities included the mayor (seated in foreground with back to camera), city commissioners and county judge

Cowhands from the sales and home service departments ready for Chattanooga Gas Company's Old Stove Round Up tie-in with the 101 Ranch Wild West Show. Other gas companies are considering similar efforts in 1950

Committee plans record A.G.A. convention

A. G. A. General Convention Committee: (Left to right) O. W. Brewer, A. G. A., registrations; L. L. Baxter, president, Arkansas Western Gas Co.; L. E. Knowlton, executive vice-president, Providence Gas Co.; Kurwin R. Boyes, A. G. A. convention manager; George E. Whitwell, Philadelphia Electric Co., committee chairman; Frank H. Adams, president, Surface Combustion Corp.; Harold Massey, GAMA exposition manager; Eugene D. Milener, A. G. A., secretary entertainment committee; Henry Fink, president Michigan Consolidated Gas Co.; A. J. Gonnoud, president, Kings County Lighting Company. Lovett C. Peters, vice president, the Laclede Gas Co., was present at meeting but is not shown in photograph

PLANS for a convention program to attract nearly 10,000 gas industry members and dealers to Atlantic City, October 2-6, 1950, were discussed last month at a meeting of the Association's General Convention Committee. Chairman George E. Whitwell, vice-president, Philadelphia Electric Co., has been active in A.G.A. work for many years. He and his committee are confident that the 1950 Annual Convention and Exhibit will draw the largest attendance in the Association's history.

Arrangements are under way for presenting a group of outstanding speakers from within the industry and from outside circles to highlight the general sessions. A list of topics is being compiled that will include subjects of interest to every branch of the gas industry.

A joint session of the Manufactured and Natural Gas Departments is scheduled for Monday morning; a general session on Monday afternoon; a general session on Tuesday morning; and Sectional meetings Tuesday afternoon and Wednesday morning. Wednesday afternoon will be left open for exhibit visits; a general session will be held on Thursday morning and Sectional meetings on Thursday afternoon.

Haddon Hall has been designated as headquarters for the Accounting Section. The Ritz Carlton Hotel will be headquarters for the Residential Gas Section, and the Industrial and Commercial Gas Section. Dennis Hotel will be headquarters for the Operating Section. The A.G.A. Home Service Committee will conduct the Home Service Breakfast on Wednesday morning and will schedule a round-table discussion on one of the days. The Personnel Committee also will hold a half-day session at a date to be announced later.

Harold Massey, manager of the Gas Appliance Manufacturers Exhibit, reports a new record has been established already in the sale of floor space, and promises that the manufacturers will offer the most impressive displays ever shown at the Auditorium. Wednesday afternoon will be held open for attendance at the Exhibit. Thursday and Friday will be designated as "Dealers' Days" and a record attendance of appliance dealers and LP-gas dealers is expected.

The Entertainment Committee is planning a program which will appeal to everyone attending the Convention. Tentative plans include the President's Reception and Dance on Monday night, with an unusual feature added. A concert and stage show followed by dancing will be offered on Wednesday night and a show program is being arranged for dealers on Thursday night. The customary ladies' bridge party will be held on Tuesday afternoon at one of the Boardwalk hotels.

Annual reports

(Continued from page 19)

land, and in connection with its present operations, the company is investigating the possibilities of storing natural gas in underground reservoirs in areas near the eastern end of its system.

Public Service Electric & Gas Co., Newark, New Jersey—A total of 32,965,949,000 cubic feet of gas was manufactured and 10,765,425,000 cubic feet of coke oven gas purchased during the year. The aggregate was a decrease of 1.36 percent from 1948. Work is progressing on construction by Transcontinental Pipe Line Corporation of a 30-inch line from Texas to New York City which will cross New Jersey. Public Service Electric & Gas Company has contracted for purchase of 70 million cubic feet of this natural gas per day, and delivery is expected to commence after October 1950.

Philadelphia Electric Co., Philadelphia, Pennsylvania.—Gas output set a new record, largely because of a substantial increase in use of gas for house heating. This service now accounts for more than ¼ of total gas sales.

The Connecticut Light & Power Co., Hartford, Connecticut—Plans are underway for expanding two-way radio communication facilities throughout the company's transmission and distribution system. Average gas sales per household customer in 1949 were 34,035 cubic feet, a decrease of 3.7 percent from 1948, owing to unusually mild weather.

Citizens Gas & Coke Utility, Indianapolis, Indiana—Tentative plans call for introduction of natural gas to Indianapolis late in 1950. This natural gas would be mixed with presently produced manufactured gas with a resultant increase in the utility's sendout capacity.

Wider distribution of the high realization by-products has enabled the utility to maintain one of the lowest manufactured gas rates in the U.S. and to serve Indianapolis customers with gas at rates lower than in 1935.

Transcontinental Gas Pipe Line Corp., Houston, Texas—The company plans to start natural gas service to New York November 1, 1950 when 200 million cubic feet a day will be available. About one-third of the 1,840-mile line from Texas to New York was completed during the company's first year of operations, but greater availability of pipe and larger working forces are expected to enable completion of the project this year. Original cost estimate of $180 million for a 26-inch line has been stepped up to $240 million for a 30-inch line. Transcontinental expects a decision in April on its application for a projected increase in the line's capacity to 505 million cubic feet a day. Delivery in the New York area would be by January 1, 1951.

Author discusses the effects of taxation in four general fields

Tax impact on public utilities

By C. E. EBLE

Controller, Consolidated Edison Co. of New York, Inc.

The subject matter of this paper is divided into four general fields.

(1) In the financial field much has been said about the scarcity of equity capital and the underlying reasons therefor. How much of this scarcity is due to the impact of taxation; and, the extent to which public utilities may feel the brunt of this condition more than other industries is one of the points that should be considered.

(2) Another field which can be discussed to advantage has to do with the meaning of so-called "double taxation" of corporations. What is this subject all about and what are its peculiarities in the utility field?

(3) Perhaps the most important tax effect to utilities has to do with equality of taxation or rather the *lack of equality*. Certainly any discussion in the utility field having to do with the impact of taxation must include this fruitful field for study.

(4) Last but not least, one cannot lose sight of the unwholesome, uneconomic and discriminatory taxes imposed on utilities and their customers.

With these four fields in mind, let us proceed with discussion.

Scarcity of equity capital—The volume of plant construction for industry in general, during the postwar period, has been unprecedented. American business spent over $16 billion for plant and equipment in 1947 and over $19 billion during 1948. Department of Commerce estimated $18½ billion of construction for 1949.

This expansion has been financed to a large extent through retained earnings (including depreciation, depletion, and other income reservations); to a lesser degree by the sale of debt securities (including debentures and bank loans); but only to a minor extent through the sale of preferred and common stock. Taking the year 1948 alone, only 4.7 percent was from stock issues. Additional debt furnished 24.7 percent while retained earnings, etc. furnished 70.6 percent. The accompanying chart shows the total requirements for plant construction for all industries, except agriculture, for the years 1939 to 1948 together with the sources from which the money was obtained. This chart also shows similar figures for the gas and electric industries alone.

Several differences between the utility results and those of industry in general are of interest. For example, most of the money requirements for these utilities were obtained through debt financing rather than from retained earnings, particularly in recent years.

In 1939, the utilities financed 91 percent plus of their requirements from retained earnings while this dropped to a low of 21.5 percent in 1948. During the same period, debt financing rose from 7.1 percent to a high of 64.4 percent. Of course the unparalleled construction expansion program in recent years within the utility industry required the attainment of additional funds from sources other than internal operations. The financing of capital requirements through the flotation of common and preferred stocks uniformly appears low both for public utilities and general business. However, the trend in the public utility field shows increasingly larger financing from this source during the past several years.

The small amount of stock sales or so-called scarcity of equity capital has been a matter of concern to business leaders generally who urge the desirability of raising more of capital requirements through equity financing. All agree that additional indebtedness incurred to finance expansion can be inherently dangerous. Memories of the great depression are too recent, with its train of

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and Forecasting

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and their Cures

A. G. Burnett
The Question Box
(Customer Accounting)

Abridged version of paper presented at 1949 annual meeting of Controller's Institute in San Francisco, California. Mr. Eble is a member of the Managing Committee, American Gas Association Accounting Section.

bankruptcy, foreclosure and receivership, to let any one forget that too much debt may well be the road to ruin.

Reducing individual income taxes may appear to be one of the obvious solutions for increasing the attractiveness of equity securities. But the large and pressing needs of the federal government under its present concept of administration preclude substantial tax reductions to individuals without alternative sources of revenue.

Two general propositions directed toward the lack of equity financing have been widely discussed. One is based on the theory advanced that the scarcity of equity financing was due largely to the lack of capital formation which in turn was caused by the impact of the heavy personal income tax rates in the higher brackets.

In order to emphasize this point, let me give some idea as to the extent to which potential savings of individuals in recent years reverted to the tax collector. Here is a comparison between the years 1929 and 1949 (after application of community property principle).

Annual *Gross Income* (Married Person)	*Remainder After Taxes* 1929		1949	
$ 5,000	$ 4,977		$ 4,370	87%
10,000	9,865	99%	8,400	84%
50,000	45,355	91%	32,800	66%
100,000	84,395	84%	53,600	54%
500,000	384,435	77%	116,000	23%

It has been estimated that on annual incomes above $5,000 savings of 30-50 percent were realized in the prewar period, whereas today income taxes take $8 billion out of a gross income of $29 billion for persons whose annual income exceeds $5,000. About ten percent remains for possible savings. The decline in the ability of the high income groups to save and use such savings in part, as heretofore, to invest in equity securities is obviously the result of large personal income taxes.

Estate and gift taxes

Estate and gift taxes also have an effect on the disposition of savings. Past accumulated savings were bequeathed intact to succeeding beneficiaries, whereas with the present estate taxes ranging upward to 77 percent there is little incentive or opportunity for large personal estates to pass from one generation to another without the consequent effect that the past savings are either dissipated through government expenditures or bequeathed to foundations or other tax exempt organizations.

My second point has to do with reducing or at least not increasing the present taxes on corporations. The dangers as a result of high or higher taxes on corporations are receiving nationwide attention. It appears to be the consensus that any increases, if there are to be any, should be determined without unduly interfering with the prospects for continued business expansion and with assurance that profits, after taxes and dividends, will be sufficient for investments and contingencies.

I personally am not so sure that the dearth of equity capital can be traced to the tax burden alone, although admittedly it may be an important factor. It appears that the rate of return or the attractiveness of the earnings of common stock equities has more to do with this problem for the moment than the tax impact. This is particularly true in the public utility field.

Also, there has been perhaps a mistaken idea as to the possible market area for equity securities. It now appears that the greatest potential market for the sale of equity stocks is to groups in the lower income tax brackets. No less an authority than Emil Schram, president, New York Stock Exchange, has advanced the view that risk capital now must be obtained from those with average or less than average income. What is needed is a new approach to the real market for the sale of equity securities at this time, and the recognition that utilities must have adequate earnings in order that their common and preferred stock be made attractive.

Double taxation as applied to public utilities—What constitutes "double taxation" has been the subject matter of considerable debate. Double taxation in its full sense is very difficult to prove in fact as I shall attempt to explain.

The reason for this is that if a corporation's income taxes are reduced or eliminated, the result may mean greater dividends. On the other hand, these savings may be diverted to the payment of higher wages and salaries or toward the reduction of the selling price of the product.

CAPITAL REQUIREMENTS AND SOURCES OF FUNDS

	DOMESTIC BUSINESSES							GAS AND ELECTRIC COMPANIES						
		SOURCES OF FUNDS							SOURCES OF FUNDS					
	Capital Requirements (Largely Plant and Equipment)	Internal Operations Retained Earnings, Depreciation, Other Accruals, etc.		External Financing				Capital Requirements (Largely Plant and Equipment)	Internal Operations Retained Earnings, Depreciation, Other Accruals, etc.		External Financing			
				Debt		Capital Stock					Debt		Capital Stock	
	Amount	Amount	Ratio	Amount	Ratio	Amount	Ratio	Amount	Amount	Ratio	Amount	Ratio	Amount	Ratio
1939	4,577	4,193	91.6	287	6.3	97	2.1	480	440	91.7	34	7.1	6	1.2
1940	6,108	5,372	88.0	601	9.8	135	2.2	550	445	80.9	77	14.0	28	5.1
1941	7,676	6,614	86.2	889	11.6	173	2.2	710	613	86.3	71	10.0	26	3.7
1942	4,702	4,078	86.7	506	10.8	118	2.5	680	570	83.8	76	11.2	34	5.0
1943	3,761	3,385	90.0	284	7.6	92	2.4	540	518	95.9	20	3.7	2	.4
1944	5,348	4,696	87.8	428	8.0	224	4.2	490	450	91.8	17	3.5	23	4.7
1945	7,134	5,870	82.3	607	8.5	657	9.2	630	561	89.1	43	6.8	26	4.1
1946	12,393	8,837	71.3	2,084	16.8	1,472	11.9	1,040	785	75.5	112	10.8	143	13.7
1947	16,180	11,386	70.4	3,572	22.1	1,222	7.5	1,900	820	43.2	796	41.9	284	14.9
1948	19,230	13,572	70.6	4,748	24.7	910	4.7	2,680	576	21.5	1,727	64.4	377	14.1

Amounts in Millions of Dollars

Sources: Survey of Current Business—U. S. Dept. of Comm.; Federal Reserve Bulletins; The Economic Report of the President—January 1949, July 1949; Commercial & Financial Chronicle; Economic Progress—N. Y. S. E., October 1947.

Therefore, it readily can be seen that taxing the income of a corporation and taxing the income of its stockholders to the extent of their dividends received may not constitute double taxation except in part. It also seems true that where the recipient of dividends from corporations is in the higher income tax brackets, the degree of possible duplication is considerably lessened.

Two methods for mitigating or eliminating "double taxation" most commonly referred to are as follows:

(1) Allow the corporation a deduction for dividends from taxable income, similar to the present bond interest deduction;

(2) Allow the stockholder a tax exemption for dividends to the extent that the corporation has already paid taxes on the income from which the dividends were paid.

Generally speaking, to permit the corporation a tax deduction for dividends from taxable income may well lead to *increased* dividends. However, in the public utility field the granting by the government of a "dividend paid credit" undoubtedly would result in such tax saving being passed on in time in the form of a reduction of the selling price of the product.

As a regulatory requirement utility companies are permitted to charge taxes as an operating expense or at least all such taxes are treated as a cost of the enterprise for rate making purposes. If we assume any relatively fixed concept as to what constitutes a rate of return, this certainly would be the case.

It reasonably may be concluded therefore that very little benefit would accrue to the utility companies' income status should there be a permissive tax deduction on dividends paid. To the contrary, such consideration may prove harmful because under regulation such reduction of taxes, as I have just stated, would merely constitute in the final analysis a reduction in the rates for service while on the other hand causing a substantial loss to the *national* revenues. These losses would have to be made up from other tax sources from which utilities could hardly expect to be exempted.

The second method seems to assure the stockholder of a tax advantage and indirectly prove to be beneficial to corporations. For example if a credit were allowed to individuals for dividends received in computing their personal tax liability, it would make the ownership of common and preferred stock tremendously more attractive.

That there is room for improvement in this double taxation field is self-evident. It is most gratifying to observe that some servants of the public interest are aware of the injustices attendant to this matter. Senator George, chairman of the Senate Finance Committee, in sponsoring relief on this matter stated that although the goal should be to exempt all dividends from double taxation, it would have to be a gradual process as the full impact would result in a loss to the Treasury Department of $2 billion annually.

Senator O'Connor, Maryland, in agreement with the thoughts expressed by the chairman of the Senate Finance Committee, stated that individual stockholders should be allowed a tax credit on dividends where the corporation paying the dividends already had paid taxes.

Tax discrimination

Discrimination—There are two types of tax discrimination that have serious effects on public utilities. One lies in the security field and of course is therefore applicable in part to industry in general as well as public utilities. The other has to do with the tax treatment accorded governmental and municipally owned utilities and other forms of tax exempt enterprises that engage competitively with privately owned utilities. First, consider the situation in the investment field.

The individual investor is interested primarily in two things: income and appreciation of his investment. With respect to appreciation, the Internal Revenue Code does not discriminate between the forms of corporate securities. Both bonds and stocks are capital assets and their appreciation is taxed as capital gain. In the matter of income, the tax law discriminates at the corporate level between income applicable to stock and income applicable to bonds by taxing the former and exempting the latter as a deduction from gross income. As a result, the advantage to the corporation of bond issues over stock as a means of low-cost financing is accentuated.

However, the really important area of discrimination in the tax field against public utilities involves the exemption of municipally and governmentally owned utilities from the payment of taxes and the tax exempt status of other enterprises which engage in the utility business. Until such enterprises are taxed on an even footing with the privately owned companies, there is an enormous advantage to those who do not contribute to the support of government.

Discrimination goes beyond the elimination of taxes on publicly owned utilities. The federal government also exempts state and municipal bonds from taxation. The results are that long-term exempt state or municipal bonds are more attractive as an investment than utility securities, particularly to high income individuals. State and municipal power agencies are, therefore, in a position to float their securities at lower rates than can be obtained by privately owned utilities.

Burdensome taxes which involve unusual administrative difficulties—Among public utilities and railroads, there are a number of excise taxes which are by their nature inequitable and which in some instances are very burdensome and costly on the companies to administer. One of these is the transportation tax.

This tax was imposed as a war revenue measure and has served its purpose. Because of the burden that its administration and collection places upon public carriers, the burden of the tax upon the mining, heavy goods, and other specific industries, and its competitive disadvantages to producers located long distances from sources of supply or markets, prompt repeal of the transportation taxes would be desirable.

Other excise imposts which affect the private utility industries, the burden of which is difficult to determine, include taxes on radios, refrigerators, air conditioners, electric appliances, electric light bulbs and tubes. Repeal of these items deserves consideration along with the others discussed previously. In fact, all the excise taxes might be studied in the light of present-day revenue requirements and the contribution of each thereto as well as their economic consequences.

Flame organ

● A curious musical instrument was the pyrophone, or flame organ, which was invented in Paris in 1875 and became quite fashionable in the salons of that city. About 12 feet in height, it consisted of 32 glass tubes of graded lengths and diameters, each of which contained a gas flame. Lowering the flames by means of a keyboard produced musical tones which had a range of four octaves and were sweet as well as hot.

—Collier's

D. W. REEVES, *CHAIRMAN* • CARL H. LEKBERG, *VICE-CHAIRMAN*

A.G.A. commercial gas school offers

Spring 1950 will feature a short course on the utilization and sale of gas for volume cooking and other commercial operations. The commercial gas school will be held at Hotel Gibson in Cincinnati, Ohio, May 1-5 under sponsorship of the A. G. A. Sales Training Committee, Terry Hart, Nashville Gas & Heating Co., chairman.

Each year the Industrial and Commercial Gas Section conducts a gas school alternating between industrial and commercial gas phases of the industry. Purpose of the 1950 school is to provide technical and sales training for men who are devoting all or part of their time to promoting or selling commercial gas. Students will be brought up-to-date on all available equipment in order to serve best the highly competitive volume cooking field.

A large market for the sale of gas for commercial operations other than in hotels and restaurants also will be covered at the school. New men need the basic training which this course will provide and experienced men will benefit by the combined refresher and advanced training.

Students will be prepared to serve best the highly competitive commercial cooking field

efresher and advanced training

Noted lecturers on the five-day program will describe the full scope of commercial gas utilization covering the markets in commercial kitchens and other commercial gas operations. Text book for the school will be the A. G. A. publication "Commercial Kitchens." Those lectures which are not covered by the manual will be supplied in mimeograph form.

Adequate rooming facilities for all who attend this school have been reserved at the Hotel Gibson. Individual assignments will be made upon receipt of students' registration. Applications, together with company check for $35, should be sent to Industrial & Commercial Gas Section, American Gas Association, 420 Lexington Avenue, New York 17. April 25 is the deadline.

Following is the program for the Commercial Gas School:

Monday—May 1

The Market For Commercial Gas—Part I—Commercial Kitchens
W. D. Relyea, Public Service Electric & Gas Co., Newark, N. J.

The Market For Commercial Gas—Part II—Other Commercial Uses
Harry B. Wilson, The Brooklyn Union Gas Company

What the Restaurant Operator Expects from the Gas Industry
A. Buenger, Hotel Gibson Corp., Cincinnati, Ohio

Foreword On Selling
F. A. Kaiser, Detroit-Michigan Stove Co., Detroit, Mich.

Water Heating for Apartment Houses and Self-Service Laundries
Harry B. Wilson, The Brooklyn Union Gas Company

Bakeries
John Goward, Michigan Consolidated Gas Co., Detroit, Mich.

Space Heating, Air Conditioning, Boilers for Tailor Shops, Bottling Plants, etc.
Julian E. Clark, Nashville Gas & Heating Co., Nashville, Tenn.

Tuesday—May 2

Gas Cooking Equipment—Functions, Types, Capacities and Controls
Ranges—Paul Inskeep, Detroit-Michigan Stove Co., Detroit

Broilers—E. H. Kahler, American Stove Co., St. Louis, Mo.

Roasting Ovens—M. H. Douglas, Vulcan-Hart Mfg. Co., New York, N. Y.

Baking Ovens—Paul C. Grimes, The G. S. Blodgett Co., Burlington, Vt.

Fryers—Dell M. Pitman, J. C. Pitman & Sons Sales Corp., West Lynn, Mass.

Warming Tables—W. R. Hoover, Duke Manufacturing Co., Sandy Springs, Ga.

Stock Kettles—Fred H. Groen, Jr., Groen Mfg. Co., Chicago, Ill.

Vegetable Steamers—J. H. Holman, Market Forge Co., Everett, Mass.

Counter Appliances—Griddles, toasters, etc.—John J. Bourke, American Gas Association

Counter Appliances—Coffee Urns—Edgar A. Jahn, American Gas Association

Wednesday—May 3

Water Heating—Dish and Pan Washing
J. Stanford Setchell, American Gas Association

(Continued on page 32)

Chemical and production men to consider issues of industrywide interest

Production program announced

ERNEST G. CAMPBELL, *CHAIRMAN* • R. VAN VLIET, *VICE-CHAIRMAN*

Fundamental problems of long-term significance to the future of the gas industry will be the center of attention at the forthcoming Production and Chemical Conference sponsored by the Operating Section of American Gas Association. The three-day meeting, May 22-24 at the Hotel New Yorker in New York City, will cover a wide variety of technical problems related to natural gas expansion and the changing character of gas industry economics. Special attention will be devoted to new developments and practical experience with gas-making processes developed by the A. G. A. research program under the PAR Plan.

Three general sessions will tackle broad-guaged problems of industrywide interest. Parallel sessions divided into gas production and chemical topics will handle subjects of interest to these groups. Two afternoons have been reserved for seven luncheon conferences at which scores of timely topics will be thoroughly aired.

Program for the Conference has been prepared by the Gas Production and Chemical Committees under the direction of the chairmen, J. P. Stephens, The Cincinnati Gas & Electric Co., and G. V. McGurl, Koppers Co., Inc., Pittsburgh.

Following a message from the Association by H. Carl Wolf, A. G. A. managing director, the opening general session will lay the groundwork for discussion of A. G. A. research results. T. L. Robey, coordinator of gas production research, will summarize the progress of various projects in this far-reaching program. Since much of the current research effort is directed toward high Btu base and peak load processes which are particularly important in connection with the expansion of natural gas, Mr. Robey's talk will be of widespread interest.

The Hall High Btu Process developed under the A. G. A. research program will receive further attention from the next speaker, Gordon G. Howie, Cambridge Gas Light Co., Cambridge, Massachusetts. Actual operating experience with this process at Cambridge will be presented in valuable detail.

Plant and field safety programs will be subjected to searching analysis by G. A. S. Cooper, Public Service Electric & Gas Co., Newark, New Jersey. Speaking on "Accidents—Almost," Mr. Cooper will present concrete recommendations on this ever-present operating problem.

The first general session on Monday will conclude with an authoritative review of coking coal reserves by R. L. Brown, U. S. Bureau of Mines, Washington, D. C.

Monday symposium

Feature of the second general session on Monday afternoon will be a symposium on reforming hydrocarbon gases, with J. L. Turnan, Worcester Gas Light Co., Worcester, Mass., acting as moderator. Both theoretical and practical experience will be presented by four outstanding experts.

E. S. Pettyjohn, director, Institute of Gas Technology, Chicago, will open the discussion with an evaluation of various methods of reforming hydrocarbon gases. Experiences at Long Island Lighting Company where the first full-scale commercial plant was installed, will be outlined by S. W. Horsfield, Long Island Lighting Co., Garden City, N. Y. Natural gas operation at the Central Gas Works will be described by J. S. Hurd, Public Service Electric & Gas Co., Nixon, N. J. Additional experiences of The Philadelphia Gas Works Company in reforming hydrocarbon gases thermally and catalytically will be presented by O. B. Holman of that company.

Prior to the symposium, W. B. Hart, Atlantic Refining Co., Philadelphia, is slated to discuss plant waste disposal. Maintenance of standby water gas plants, a topic of timely importance, will be presented by H. G. Kaess, Minneapolis Gas Company. Rounding out the Monday afternoon session will be a report on public health service water pollution control by L. F. Warrick, U. S. Public Health Service, Washington, D. C.

Both the Chemical and Gas Production Committees are sponsoring full-fledged meetings Tuesday morning. Major portion of the chemical session will be devoted to a symposium on the synthesis gas production research and development program of the U. S. Bureau of Mines, Morgantown, W. Va. Objectives and general scope of the program will be presented by L. D. Schmidt. Other participants will include John H. Holden, C. W. Albright, G. R. Strimbeck, L. P. Rockenbach, J. B. Cordiner, A. E. Sands, H. W. Wainwright, and C. G. Egleson. Pilot plant gasification of pulverized coal with oxygen and highly superheated steam will be discussed. Other symposium topics include the fluidized coal feeder, and organic sulfur in gas.

Use of the Rochester test burner in predicting the interchangeability of fuel gases will be presented in detail by Louis Shnidman and Jesse S. Yeaw, Rochester Gas and Electric Corporation. The chemical session will close with an informative report on gas leak detection practices by F. P. Mueller, The Peoples Gas Light and Coke Co., Chicago.

Emphasis at the gas production session will be directed at natural gas mixing or replacement problems. Complete replacement of natural gas sendout, the lead-off topic, will be handled by F. D. Howell, Dominion Natural Gas Co., Brantford, Ontario. Experience with controlled gas mixing will be outlined by R. B. Paquette, The Peoples Gas Light and Coke Co., Chicago. Safety principles in the operation of LP-gas plants will be laid down by H. Emerson Thomas of Westfield, New Jersey.

At the same meeting, J. W. Blatchford, E. I. duPont de Nemours & Co.,

J. P. Stephens, The Cincinnati Gas & Electric Co., is chairman, A. G. A. Gas Production Committee

G. V. McGurl, Koppers Co., Inc., Pittsburgh, is chairman of the A. G. A. Chemical Committee

Dr. F. E. Vandaveer, The East Ohio Gas Co., general sessions speaker and luncheon official

Charleston, W. Va., will speak on the use of oxygen in the manufacture of blue gas. This session will close with an evaluation of gas analysis by H. E. Ferguson, The Peoples Gas Light and Coke Company.

Four luncheon conferences are scheduled for Tuesday afternoon with a wide variety of topics listed for informal discussion. They will be divided as follows: Carbonization and Coke—Forrest D. Miller, Philadelphia Coke Co., chairman, and H. C. King, Rochester Gas & Electric Corp., alternate chairman; High Btu Gas—B. M. Keys, Washington Gas Light Co., chairman, and Gordon G. Howie, Cambridge Gas Light Co., alternate chairman; Oxygen and Its Application to Gas Making—C. R. Downs, New York, chairman, and L. L. Newman, Bureau of Mines, alternate chairman; Plant Waste Disposal—Linn B. Bowman, Rochester Gas & Electric Corp., chairman, and Dr. F. E. Vandaveer, The East Ohio Gas Co., alternate chairman.

The final general session on Wednesday morning will present seven papers on new operating and equipment developments. N. K. Senatoroff, Southern Counties Gas Co., Los Angeles, will bring the delegates up to date on odorization practices and E. E. Johnson, California Research Corp., Richmond, Calif., will talk on recent developments in odorants. Corrosion in condensers, precipitators and purifying boxes will be the topic of a report by J. L. Adkins, The Peoples Gas Light and Coke Co., Chicago.

Advances in plant building and equipment will be summarized by Carl A. Schlegel, United Engineers & Constructors, Inc., Philadelphia, chairman, Builders' Subcommittee. Dr. F. E. Vandaveer, The East Ohio Gas Co., Cleveland, will deal with underground storage of natural gas, and J. G. Sweeney, The Brooklyn Union Gas Co., will relate the latest information on tar treatment in the gas industry. E. S. Pettyjohn will present the concluding general session feature entitled "Evaluation of Oils for Carburetted Water Gas Operation."

The three remaining luncheon conferences will round out the conference program on Wednesday afternoon. They will cover: Chemistry in the Gas Industry—J. F. Foster, Battelle Memorial Institute, Columbus, chairman, and H. M. Killmar, Carborundum Co., Perth Amboy, N. J., alternate chairman; Liquefied Petroleum Gas—S. W. Horsfield, Long Island Lighting Co., chairman, and William Kramer, Phillips Petroleum Co., alternate chairman; Water Gas—A. G. Hall, The Brooklyn Union Gas Co., chairman, and H. P. Richmond, Cumberland County Gas Co., Millville, N. J., alternate chairman.

A wealth of material is being assembled for informal presentation at the luncheon conferences. Since no record will be made at these sessions, attendance is necessary to keep abreast of the developments discussed. The conference as a whole will provide the answers to many problems at a time when the gas industry is undergoing more or less revolutionary changes in character.

FLASH!

News from Detroit as the Monthly goes to press indicates record attendance and interest for the

A. G. A. DISTRIBUTION

MOTOR VEHICLES AND CORROSION CONFERENCE

April 3-5, 1950

A comprehensive report and picture story of the sessions and luncheon meetings will appear in the May Monthly

Automatic gas clothes dryer—curfo

By D. C. McDERMAND

Home Appliance Division
Hamilton Manufacturing Co.
Two Rivers, Wisc.

This is the "Story of a Pin Up Girl." She's not quite the kind of a pin up girl you might expect, but she has her interesting points, too. She is particularly interesting because she represents the 2½ to 3 million potential dryer sales that are literally "hanging on the line" for utilities and dealers during the next five years.

The pin up girl I refer to is, of course, the gal who has to pin up laundry on a clothesline. She is easy to identify, because in her hand and in her mouth she carries a badge—the badge of a drudge—the common clothespin. That badge spotlights an immediate customer for an automatic *gas* dryer. There are hundreds more in each territory.

Presented at several of the A. G. A. Spring Style Show regional meetings which were sponsored under the Association's PAR Plan.

You can find these potential customers everywhere—they are the women whose yards are filled with clothes and clotheslines. When you see them closer, they are the women who finish up each wash day looking as if they'd gone through the wringer with their clothes.

This pin up girl is more than a drudge. She's practically a one-woman track team on wash day. If you doubt it, just follow an average housewife through part of a typical day while she launders for a family of four.

Let's pick her up around 9:00 A.M., as she's about ready to hang the first clothes out to dry. Sounds simple when you say "hang the clothes out to dry." But did you ever stop to watch what it involves? First, she lifts about 30 to 35 pounds of wet laundry three feet off the floor.

Still holding the basket of clothes waist high, she somehow staggers up 11 or 12 stairs, out the back door and over to a clothesline. Then her setting up exercises begin. Stoop, pick up a garment or two, stand up, stretch, pin it to the line. Back to the basket, stoop, pick up, stand up, pin up. Forty garments—forty push ups—forty pin ups.

Three times she does this—at least one solid hour of lifting, lugging, walking, stooping, raising up, reaching, and pinning. A hundred pounds of wet clothes she carries out—5,200 pounds a year. They call her the weaker sex but she carries the equivalent of a two-and-a-half ton truck around her basement and yard each year.

During the next three hours or so, the clothes are drying—she hopes. They will be drying—*if* the sun stays out, *if* the rain stays away and *if* the wind doesn't blow them down.

So, the clothes are dry. Next step—the whole process is reversed. She picks up the basket, walks to the line, reaches, stretches, unpins, stoops, raises up, reaches and repeats until the clothes are all down and carried in.

Her clothes are dry at last—*too dry*. For another half hour she must sprinkle them to be ironed. Let's see what the score is on time so far.

Loading time—the time she spent hanging out the clothes—one hour of back-breaking labor. Drying time—three hours. Unloading time (taking down

cur for a life at hard labor

the clothes)—one-half hour. Sprinkling time—one-half hour. Total—*five hours for drying alone!*

Unless she wants life at hard labor, this woman—and millions like her—is an eager, potential buyer for an automatic gas dryer. She's willing to admit that hanging clothes on a line is hard, tedious work. What she may not know is how much simpler and easier drying can be with an automatic gas dryer, how much time and energy she can save and how much better her clothing will be dried.

Telling her and showing her that story opens up a new market and gives the gas industry the biggest profit opportunity in the home appliance business.

Our pin up girl must know, for instance, that she can toss her clothes into the dryer just as they come from the washer. She carries a comfortable load the few steps from washer to dryer, opens the door and drops them in.

Wouldn't she be thrilled to know that when she sets the heat control and turns on the automatic timer switch, that the gas dryer takes over complete charge of the job! It regulates the heat and even shuts itself off at the right time. Being automatic, the dryer frees her to run another washer load or even to start her ironing from a previous dryer load.

She should know how dramatically her wash day can be shortened. She can load and unload her gas dryer in just a couple of minutes. She can damp dry rayon and lightweight cottons in 15 to 20 minutes, medium weight cottons in 25 to 30 minutes, and even heavy cottons take only 30 to 40 minutes, depending upon the condition of her wringer or spinner. And damp drying completely eliminates the need for sprinkling.

With an automatic gas dryer, she saves more than 20 work days of eight hours each every year. It has been proved time and time again that when women know the automatic gas dryer—particularly when they've seen it demonstrated or *have had a chance to use it*—they like it enough to buy it. Here are some of the more important features women like about it.

(1) The automatic gas clothes dryer takes all the hard work out of washing. It's hard and it's dangerous to lug a heavy basket up and down cellar steps. It's hard on the back to bend, stoop and stretch to pin clothes on the line.

(2) It's a time-saver deluxe. With a gas dryer anyone can wash, dry and iron in the same day. They can wash, dry and iron in the same evening, if they want to. They are no longer at the mercy of the clock or the sun. The dryer not only dries clothes about as fast as you can wash, but saves ironing time as well. Many articles come out of the dryer so soft and fluffy that they need no ironing.

(3) It does away with weather worries. Rain, snow, hail, or sleet, the gas dryer owner is independent of the weather.

(4) The automatic gas dryer is sanitary and healthful. It eliminates soot, dust and wind problems, and avoids unsanitary outdoor drying problems. It breathes in clean air, and doesn't pick up all the airborne diseases which may be transmitted from clothesline to clothesline by flies.

(5) It saves clothes by eliminating wear and tear from clothespins and high winds. There is no fading caused by bright sun—and no damage from freezing.

(6) It allows more compact working

space because unsightly lines are eliminated from laundry and yard.

So much for what a dryer will do for the pin up girls. Now, what can it do for the dealer? What's in it for you as a merchandiser?

(1) When you sell an automatic gas clothes dryer you can cash in on a profit opportunity as big as existed for refrigerators in 1928. You have something new to tell your customers, something new to offer them.

(2) A dryer sale is a clean sale. There is no trade-in to consider and it has no competition in any other appliance the homemaker now owns. It stands alone.

(3) It doesn't cost so much to install and doesn't cost much to service. There are only three moving parts—the drum, the fan and the pulley. This simple action means long life and dependable performance. You safely can say that the automatic dryer has the lowest service cost of any major appliance. That means fewer service calls and fewer headaches —for the gas industry. The gas drying element is also simple, efficient and safe. It uses any kind of gas—natural, manufactured or bottled. Installation requires only a one-half inch gas supply line and 110-volt electrical connection for the motor. Based on a rate of 90 cents per thousand cubic feet, each dryer load costs about 1½ cents to dry.

(4) Finally, every time you sell a dryer you make a friend. Customer satisfaction and consumer enthusiasm for the dryer in use are greater than for any other appliance.

Now what does the automatic gas clothes dryer do for you as proponents of gas?

First of all, of course, it builds load and, surprisingly enough, the load is an evenly distributed one. This is true, because when the housewife becomes accustomed to using her dryer, she finds that washday is a thing of the past. She does her laundry as it accumulates, using her dryer about 2½ to 3 days a week and eliminating the tremendous peak load on Monday.

Second, it gives you "glamour with gas." The dryer market is the only one in which we are not selling a more efficient appliance over a less efficient appliance. Our competition is the clothespin. We are selling a modern, romantic, efficient, dramatic way of doing a job that has for thousands of years been connected with time consumption and back-breaking labor.

Thirdly, it gives you control of the laundry with the gas dryer and gas water heater, as you now have control of the kitchen with the range and refrigerator.

The pin up girl we talked about represents all of the women who make up today's dryer market. Let's look closer and see who she really is. First, she is 99 out of every 100 housewives, because, believe it or not, only about one woman in 100 owns a clothes dryer today.

She is a woman who uses old-fashioned drying methods. She is everyone who comes into your store, because everyone who comes into your store is a prospect. But how are you going to turn those prospects into dryer sales?

You're going to sell dryers by using the same tried and true methods of merchandising that have always proved successful before. You're going to have to carry the story to your customer and not wait for your customer to come to you. You are going to sell dryers by advertising, by enclosing folders with invoices and statements, and letting your customers know that you handle this marvelous new device—by putting the dryer in your show window and running "live" demonstrations, by "using the user" and by putting dryers in the home of prospects on a free home trial basis.

Those who have tried it know that if you once get a dryer into the home of a real qualified prospect, you are not going to take it out. The people who are doing this are selling dryers, and lots of them. For instance, The Brooklyn Union Gas Co., The Manufacturers Light and Heat Co., Pittsburgh, Public Service Electric and Gas Co., and others. Dryers "sell themselves" so well that no merchandising method has yet been found which is as successful as the free home trial program.

The automatic gas dryer offers a new romantic story for sales promotion, another opportunity for raising living standards, for greater comfort and health, as a new ideal in living.

The product is right, the time is right, and the market is receptive. The women of America have accepted and endorsed the dryer in these past three years in a manner never before paralleled in the appliance industry. The one-percent saturation of the market that has been attained in this period is an outstanding record, and is truly indicative of the tremendous potential that exists.

There are today some 13 dryer brands on the market. The industry volume in 1950 is expected to reach 60 to 75 million dollars.

Opportunity knocks again—a great opportunity for leadership and profit. Do *now* what should be done to place yourself in a position to serve this new and rapidly growing market.

Commercial gas school

(Continued from page 27)

Planning a Kitchen
E. V. Fineran, Washington Gas Light Co., Washington, D. C.

Kitchen Layouts
Jacques Berling, The John Van Range Co., Cincinnati, Ohio

Installation and Service
L. J. Fretwell, Oklahoma Natural Gas Co., Tulsa, Oklahoma

Thursday—May 4

Competitive Claims and Kitchen Ventilation
C. George Segeler, American Gas Association

Comparison of Competitive Equipment as Shown by Tests
Walter B. Kirk, American Gas Association Labortaries

Facts of Fuel and Energy Computations
C. George Segeler, American Gas Association

Demonstration on Baking—Frying—Roasting
G. T. Carlin, Swift and Co., Chicago, Ill.

Friday—May 5

Customer Contacts—Selling Tools
John J. Bourke, American Gas Association

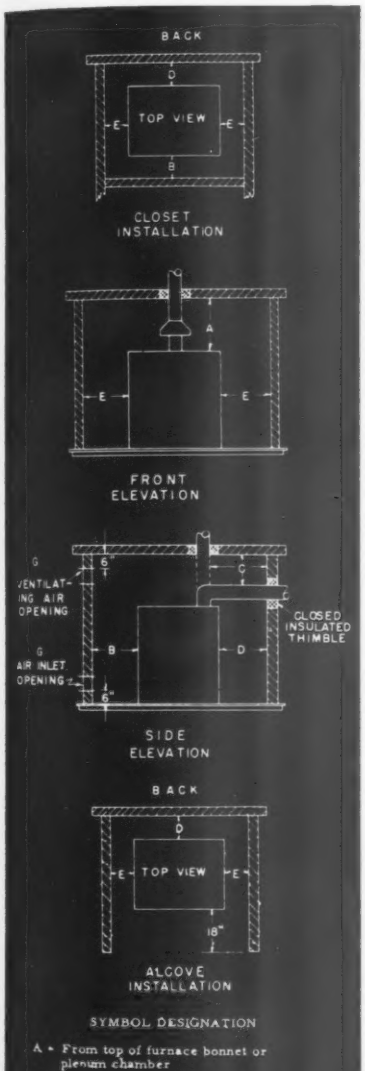
Sales Techniques
Milton J. Firey, Congress Hotel, Baltimore, Maryland

EXAMINATION

A. F. BRIDGE, *CHAIRMAN* · EDWIN L. HALL, *DIRECTOR*

Revisions and additions offer valuable assistance to the industry

Gas industry standards adopted



Enclosure approval types and clearance nomenclature of alcove and closet installation tests

Important new and revised gas industry standards were adopted by American Gas Association Approval Requirements Committee at its March 7 meeting held at the A.G.A. Laboratories.

Two of these standards are of particular interest to the industry. The first is devoted to installation of gas piping and gas appliances in buildings, and the second to test procedures for approval of central heating furnaces and boilers for location in confined spaces such as alcoves and closets.

Entitled "Proposed American Standard Installation of Gas Piping and Gas Appliances in Buildings," the new text represents a complete revision of former "A.G.A. Requirements and Recommended Practices for House Piping and Appliance Installation." It will be submitted to American Standards Association for approval as American Standard in the same manner as all A.G.A. requirements.

Two former standards sponsored by American Gas Association and National Fire Protection Association which provide coverage along similar lines have been withdrawn by mutual agreement of all those concerned in preparation for action by American Standards Association. These were the "Gas Safety Code for Installations and Work in Buildings" (American Standard K2-1927) jointly sponsored by A.G.A. and National Bureau of Standards; and "Installation, Maintenance and Use of Piping and Fittings for City Gas" (American Standard Z27-1933) sponsored by National Fire Protection Association. Interests of these sponsors are fully represented on the A.G.A. Approval Requirements Committee which is also a sectional committee of American Standards Association. Consequently, complete cooperation was achieved in formulating the new requirements.

The new installation standards are national in character and as such are sufficiently general in scope to cover local policies in accordance with good practice. They apply to piping systems in buildings for low pressure gas not exceeding ½ pound per square inch. They cover the installation and operation of residential and commercial appliances supplied through such systems by public utilities supplying fuel gases such as natural, manufactured, and liquefied petroleum-air gases or their mixtures. They do not apply to systems distributing liquefied petroleum gases nor to those serving industrial applications.

Wide distribution of the new standard is expected, not only among gas utilities and manufacturers, but also among others interested in the installation of piping and appliances. For their added convenience, publication will be made in pocket size.

Requirements adopted for the approval of central heating furnaces and boilers for use in confined spaces are entirely new. They establish procedures for testing with clearances from combustible surfaces of less than six inches for this class of equipment for the first time. Representatives of the Underwriters Laboratories cooperated in preparation of the new text which embodies procedures employed by that organization. Approval for confined space installation may now be obtained as a part of the testing service provided by A.G.A. Laboratories.

Since special types of installations are covered, the new standard is entirely optional and will be applied only upon request. While the standard does not become effective formally until January 1, 1951, the Laboratories will be in a position to test for confined space approval at an *(Continued on page 48)*

Industry news

Natural gas meeting to cover "three R's"

A NEW INTERPRETATION of the "three R's" will be offered at the Spring Conference of the National Gas Department, American Gas Association at the Mayo Hotel in Tulsa, Okla., on May 8 and 9, 1950. Reserves, rates and research will be three of the important topics to be discussed at the two-day meeting. Paul R. Taylor, vice-president, Stone & Webster Service Corp., and the members of his program committee, have assembled an excellent array of specialists to discuss these subjects.

Delegates will be welcomed to Tulsa by Honorable Roy Lundy, Mayor of the oil capital, at the opening general session on Monday, May 8. D. A. Hulcy, president, Lone Star Gas Co., and director, A. G. A. Natural Gas Department, will preside at both general sessions, and will deliver the opening address on Monday. Well versed in every phase of the natural gas industry, Mr. Hulcy's talk "A Fuel With a Future" will be of interest to every natural gas man at the conference.

A considerable portion of the money devoted to research under the A. G. A. PAR Plan has been expended on projects to improve transmission, distribution and storage of natural gas. Elmer F. Schmidt, vice-president, Lone Star Gas Co., and chairman of the Technical and Research Committee, A. G. A. Natural Gas Department, will bring the delegates up to date on the many research projects in the A. G. A. program that are specifically devoted to natural gas.

Overlapping boundaries of regulation between federal and state commissions have long been a problem of the natural gas industry. Several recent court and commission decisions may have a heavy impact on the rapidly expanding natural gas business. Wesley E. Disney, counsel, The Independent Natural Gas Association of America, will comment on some of these pertinent decisions.

Hugh H. Cuthrell, vice-president, The Brooklyn Union Gas Co., and president, A. G. A. will be the opening speaker on the second day of the conference. The phenomenal spread of the natural gas pipeline systems is changing the economic future of the entire gas industry. Mr. Cuthrell will point out some of the many ways in which A. G. A. is working to keep abreast of these economic changes. His title will be "The Gas Industry—Today, and Tomorrow."

The A. G. A. Committee on Natural Gas Reserves has just completed a very favorable report on reserves of natural gas and natural gas liquids in the United States. N. C. McGowen, president, United Gas Pipe Line Co., and chairman of the Reserves Committee, will bring to the delegates some of the highlights of that report and a concise picture of progress of the natural gas industry.

Natural gas rates have become a controversial subject in many areas. There are many facets to the rate question and three outstanding speakers have agreed to present different phases at the Conference. Guy T. Henry, president, Central Indiana Gas Co., Muncie, Ind., will speak on the effect of higher costs on gas company operations. Walter T. Herrman, Commonwealth Services, Inc., New York, N. Y., will tell how rates can help in a solution of this problem. The name of the third speaker will be announced in the near future.

Oliver S. Hagerman, president and general manager, Virginia Gas Transmission Corp., has arranged for the showing of the Columbia Gas System's new motion picture, "The Toughest Inch." Mr. Hagerman will offer a brief introduction to this interesting film.

An open meeting of the Transmission Committee is scheduled for Monday afternoon and all members of the industry interested in this phase of natural gas operations are invited to attend. The committee chairman, F. A. Hough, vice-president, Southern Counties Gas Co., Los Angeles, will preside.

Five feature attractions are planned for the Transmission session. W. C. Mosteller, assistant to vice-president, Southern Counties Gas Co., will discuss "Transmission Line Type Storage—Capacity Calculations and Cost." Title of the second event is "New Data on Use of Solid Desiccants." E. Paul Wilkinson, Magnolia Petroleum Co., Dallas, will be the speaker. Boris Sterk, Socony-Vacuum Oil Co., Brooklyn, is co-author.

"Trace Removals of Sulfur Compounds from Natural Gas" is the title of an address by J. L. Oberseider, Southern California Gas Company. Kurt Niehus, assistant technical director, Brown-Bovari Corp., New York, will discuss "Recent Gas Turbine Installations in Europe." Final event on the Transmission program will be a showing of the motion picture "Pipeline Construction in Rough Terrain" under the sponsorship of H. C. Price Co., Bartlesville, Oklahoma.

Gas companies win water heater trophies

SIX GAS COMPANIES have been named as winners of the Court of Flame sales trophies. The awards were made for exceptional effort in selling Court of Flame automatic gas water heaters in the recent yearlong sales campaign conducted by Gas Appliance Manufacturers Association and 22 sponsoring gas water heater manufacturers.

Awards were made on the basis of the greatest number of Court of Flame heaters sold for the year by company salesmen and dealers combined per thousand residential meters.

Winners are The Brooklyn Union Gas Co., Brooklyn, N. Y.; Rochester Gas & Electric Corp., Rochester, N. Y.; The Hartford Gas Co., Hartford, Conn.; Delaware Power & Light Co., Wilmington, Del.; East St. Louis Division, Illinois Power Co., East St. Louis, Ill., and Spring Valley Division, Rockland Gas Co., Inc., Spring Valley, N. Y.

According to J. F. Donnelly, chairman of the 1949 Sales Promotion Committee, Gas Water Heater Division, GAMA, "These awards are the Oscars of the gas water heater industry and stand for excellence in the field of selling. The cited gas companies have done the best selling job on automatic gas water heaters and this bronze 'Court of Flame' trophy is a symbol of a job well done."

ASTM publishes standards on gaseous fuels

THREE STANDARDIZED TESTS are included in "A.S.T.M. Standards on Gaseous Fuels," a new booklet issued by American Society for Testing Materials. Developed by A.S.T.M. Committee D-3, the three tests are: Standard Method of Test for Calorific Value of Gaseous Fuels by the Water-Flow Calorimeter (D900); Tentative Methods of Test for Specific Gravity of Gaseous Fuels (D1070); and Tentative Methods for Measurement of Gaseous Fuels Samples (D1071).

First of these tests covers gaseous fuels from 300 to 3,000 Btu per cubic foot. The information provided covers terminology, apparatus, testing procedures, theory of calculations and corrections, reproducibility of results, and extensive tables.

Covered in the second report are various methods of determining specific gravity of gaseous fuels at normal temperatures and pressures by comparing the fuel with dry air at the same temperature and pressure. These methods are based on the assumption that the fuel gases tested follow the ideal gas laws. Subjects covered include terminology, accuracy, type of test, sampling, various methods, and several appendices giving operating precautions, care of the apparatus, corrections, adjustments, etc.

The third report covers various methods of measuring the volume of gaseous fuel samples. Subjects include terminology, units of measurement, capacity of apparatus and range of operating conditions, calibrations, etc.

Copies of "A.S.T.M. Standards on Gaseous Fuels" can be obtained from American Society for Testing Materials, 1916 Race St., Philadelphia. Prices are: 1-9 copies, $1.15 each; 10-49, 85 cents each. Prices to ASTM members are 85 cents and 70 cents, respectively.

New England gas companies push video show

BOSTON CONSOLIDATED GAS COMPANY has been joined by six other utilities in sponsoring the first full-scale, live dramatic television show ever to be televised from a New England studio. The series is reportedly the first of its type and size to be sponsored by any gas utility in the country. Sponsors include Cambridge Gas Light Co., Dedham & Hyde Park Gas Co., Milford Gas Light Co., Old Colony Gas Co., Plymouth Gas Light, and Worcester Gas Light Company.

The presentation—"That Young Couple"—is televised each Sunday afternoon at 4:30 for one-half hour at NBC's Boston Station, WBZ-TV. Featured in the production are the cast of the Brattle Theatre Co., a well known professional repertoire theatre.

"That Young Couple" is a specially-written new series of domestic comedies—the story of a young surburban New England couple, Susie and Ernest Young, and their trials and tribulations.

Scripts for the production are written by Ruppert Pray, Hollywood-New York writer, well-known in radio-television circles for his contributions to such productions as "Ozzie and Harriet," "Vic and Sade," "The Goldbergs."

Scenes for the play are laid in the Young's home where there is an all-gas kitchen set. Action carries over to the sales floor of the local gas company thus affording a perfect vehicle for the display of modern gas appliances and for a natural injection of the gas story into the dialogue.

A staff of 50 people is required to put the show into televiewers' homes. The program is designed to provide interesting and wholesome entertainment for the entire family. It is a perfect vehicle for showing modern gas appliances in modern settings and for telling the gas story to WBZ-TV's three-quarters of a million viewers.

Natural gas storage development shown

ONE OF THE new technological developments in the gas industry was unveiled in Warren, Pa., last month. More than 50 public utility engineers and executives inspected a pilot plant demonstration of using a solid fireproof adsorbent material within an above-ground container for the storage of natural gas.

The demonstration was held by the Floridin Co., Warren, Pa., which in conjunction with J. F. Pritchard & Co., Kansas City, Mo., developed the practicability of storing natural gas on "Methanite," a fuller's earth material.

Representatives of gas utility and insurance companies, plus several engineers of other organizations, were given engineering and visual evidence that the experimental size plant proved the basic laboratory research results which were more than a year in development.

Insurance company representatives were shown the new method's ability to store natural gas with no more than ordinary gas plant operating hazards.

C. V. Spangler of the Pritchard organization reported that the pilot plant operation definitely proved that the natural gas stored in the granular adsorbent at a temperature of — 260° F did not flow away as a liquid, but was released slowly as a gas when exposed to the atmosphere.

In the pilot plant natural gas was compressed, cooled, and then pre-treated by adsorbents for the removal of moisture, gasoline and liquefied petroleum gas components. The gas was cooled to remove ethane and to condense methane. The resulting liquid was then flashed to a low pressure for further cooling, after which it was introduced into the "Methanite" storage container.

The pilot plant has a capacity to store more than 600 cubic feet of methane in two cubic feet of "Methanite" granular adsorbent. The new above-ground storage method is now ready for commercial application.

Hulcy honored

TOP BUSINESS and civic leaders in Dallas, Texas, joined early this year in paying tribute to D. A. Hulcy, who for three years has headed that community's top city building organization. Mr. Hulcy, president, Lone Star Gas Co., Dallas, and vice-president, American Gas Association, was honored for his three terms of community service as president of the Dallas Chamber of Commerce. He was presented with a silver plaque at a special luncheon.

Officials who participated in the ceremonies described Mr. Hulcy as a leader not only in Dallas, but also in the international business world.

Appalachian gas course

THE TENTH ANNUAL Appalachian Gas Measurement Short Course will be held on August 30—September 1, 1950, at West Virginia University, Morgantown, West Virginia. Plans for the school were made at meetings of the general committee and the program committee recently held at Morgantown.

The school is conducted by the university in cooperation with gas utility companies and meter manufacturers operating in the Appalachian area. Fred H. Bunnell, Consumers Power Co., Jackson, Mich., is chairman of the general committee, and R. A. Seifert, The Cincinnati Gas and Electric Co., Cincinnati, Ohio, is chairman, program committee.

Range firm wins coveted ASIE award

Detroit Michigan Stove Company has received the Merit Award of American Society of Industrial Engineers for outstanding contributions to productive arts and sciences in its field. In photo above, John A. Fry (right) president of the firm, receives award from Ivan N. Cuthbert, chairman, ASIE awarding committee. Award is the only one presented to a manufacutrer of cooking ranges

St. Louis area receives "gas education"

MORE THAN 100,000 spectators from St. Louis, Mo., viewed a colorful and dramatic "education in gas" which was sponsored early this year by the Laclede Gas Company. The event took place at the Home Bildors Show in St. Louis, February 11-19.

Public interest in the gas company display was spurred by large advertisements in the three major St. Louis newspapers telling about the exhibit and the part that gas would play in it. These advertisements and accompanying publicity stories concentrated on two special features of the exhibit—a fully equipped gas kitchen and special cooking demonstrations.

Converging upon this kitchen were complete exhibits of gas air conditioning, refrigeration, cooking, water heating and laundry drying. The best modern gas appliances were installed according to a scientific plan which economized on the waste movements that a housewife makes in the course of her daily work.

Each day of the show approximately 5,000 people viewed the kitchen, making it one of the most popular spots in the entire Bildors Show.

This colorful New Freedom Gas Kitchen was the center of the Laclede Gas Company exhibit which provided a dramatic "education in gas" during the recent Home Bildors Show in St. Louis, Missouri

Hawaii trip heads Portland (Ore.) contest

"Size 'em up" refers to automatic gas water heaters. However, appliance dealers and plumbers attending the kick-off meeting of Portland (Ore.) Gas & Coke Company's "Hawaiian" water heater contest also "sized up" the hula dancers shown in the picture above. Contest features an expense-paid Hawaiian vacation for two, weekly cash prizes totaling $1,000 and additional cash prizes for salesmen. Contestants obtain entry blanks from dealers or the gas company and complete in 35 words or less the sentence "Every home needs an automatic gas water heater because . . ."

Combustion publication

Review of "The Third Symposium on Combustion and Flame and Explosion Phenomena"—762 pages, $13.50, The Williams & Wilkins Co., Baltimore 2, Maryland.

ONE OF THE OUTSTANDING DEVELOPMENTS in aviation during the past decade is the use of liquid propellant type motive power. The great strides made in the field of jet propulsion have created a revival of interest in the problems of combustion and ignition of gaseous and liquid fuels.

To consolidate the most recent information on these subjects, a symposium was organized on combustion and flames and explosion phenomena at the University of Wisconsin in September of 1948. This symposium was the third in the series, and credit is due to Dr. Bernard Lewis of the U. S. Bureau of Mines for organizing it.

In order that the great amount of scientific and technical information presented at the symposium have wider distribution than that accorded to those who were present in Madison, the majority of the papers presented were published in the volume being reviewed. The wide variety of subjects covered fell into the following broad classes:

- Flame stabilization and quenching
- Flame propagation in explosive gas mixtures
- Ignition of gas mixtures
- Kinetics and mechanism of combustion reactions
- Flame spectroscopy and radiation
- Burning and detonation of explosives
- Thermodynamics of flame gases and thermochemistry
- Experimental techniques
- Combustion in engines and rockets
- Gas burners and furnaces.

A large number of the 100 papers in the book should be of immediate interest to the engineers and scientists in the gas industry. Of particular value would be the papers dealing with "Temperature Measurement on Complex Flames," "The Mechanism of Flash-Back of Aerated Flames," "The Structure and Stability of Diffusion Flames," "A Study of Burning Velocity," "Ignition of Explosive Gas Mixtures by Electric Sparks," and many others.

Within the space limitations of this review, it is only possible to suggest that those who are active in the study of flames and ignition become acquainted with the wide range of papers in this book—*S. G. Erkin, director of research, Robertshaw-Fulton Controls Company.*

Fourth quarter gas sales, revenue rise

TOTAL REVENUES from sales of gas by utilities for the fourth quarter of 1949 were $435 million, an increase of 8.1 percent over the like quarter of 1948, according to American Gas Association. Revenues from commercial sales represented the highest percentage gain, rising 13.7 percent. Residential gas revenues were up 10.4 percent and industrial gas revenues gained 0.3 percent over a year earlier.

In the 12-month period ending December 31, 1949, total revenues from utility sales of gas were $1,658,000,000, an increase of 7.4 percent over revenues of $1,543,000,000 in the previous 12-month period.

The gas utility industry was serving 23,500,000 customers at the end of December, 1949, an increase of 5.3 percent over 1948. Residential customers totaled 21,700,000, an increase of 4.6 percent over the 20,700,000 served in the previous year. Commercial and industrial customers gained 15.1 percent and 7.4 percent respectively.

Total revenues from natural gas sales during the fourth quarter of 1949 were $290 million, a rise of 11.7 percent over the comparable quarter of 1948. For the 12 months ending December 31, 1949, revenues from natural gas sales were $1,078,000,000, an increase of 10.4 percent over 1948 when natural gas revenues were $976 million.

Sales of natural gas during the fourth quarter totaled 820 million Mcf, an increase of 9.5 percent over the like quarter of 1948. For the year ending December 31, 1949, sales of natural gas amounted to 3,075,000,000 Mcf, a gain of 9.0 percent over sales of 2,822,000,000 Mcf, in the like period a year earlier. At the end of December, 1949, about 13,300,000 customers were being served with natural gas, an increase of 13.1 percent over the previous year.

Revenues from manufactured gas sales in the fourth quarter of 1949 totaled about $123 million, an increase of 3.6 percent over $119 million in the like period in 1948. For 12 months ending December 31, 1949, manufactured gas revenues were $485 million, a gain of 4.4 percent over a year earlier.

Manufactured gas sales in the fourth quarter of 1949 totaled 110 million Mcf, an increase of 1.4 percent over 109 million Mcf sold a year earlier. For the 12 months, manufactured gas sales were 432 million Mcf, down 3.2 percent under 446 million Mcf sold in the comparable period in 1948. Manufactured gas customers declined slightly in the fourth quarter, totaling 8,600,000, a decrease of 0.1 percent.

Revenues from mixed gas sales in the fourth quarter of 1949 were about $23 million, a decline of 7.6 percent below the comparable quarter in 1948. For the 12 months ending December 31, 1949, mixed gas revenues totaled $95 million, a drop of 7.4 percent under a year earlier.

Mixed gas sales in the fourth quarter of 1949 were 32 million Mcf, a decrease of 7.8 percent under a year earlier, when mixed gas totaled about 35 million Mcf. For the 12 months ending December 31, 1949, mixed gas sales were 138 million Mcf, a decrease of 7.1 percent under 148 million Mcf sold in the previous year. Mixed gas customers at the end of December, 1949, numbered 1,600,000 customers, a decrease of 17.8 percent under the previous year.

High temperature gas turbine in use

A 2,000 HORSEPOWER high temperature gas turbine—newest practical source of power—has been harnessed by U. S. industry. The new type engine, built by the Westinghouse Electric Corp., has been put into service at Wilmar, Ark., midway between St. Louis and the Louisiana oil fields, by the Mississippi River Fuel Corp., to pump natural gas through a 22-inch pipeline. This allows flexibility in testing the entire operating range of the unit. Incorporating much of the knowledge gained in designing power plants for high speed aircraft, and extensively using materials containing nickel, the gas turbine already has completed more than two thousand hours of successful tests.

The gas turbine has many advantages which promise wide industrial use in the future. For one thing, it is said to turn out more power per pound of weight than any other industrial power plant. It requires the minimum of building and foundation and can be transported into remote, undeveloped regions. It can be set up, ready to operate, in a relatively short time. Furthermore, it needs no water for cooling, very little lubricating oil, and maintenance problems are practically eliminated due to few moving parts.

The Gas Turbine Gas Line Pumping Unit consists of a straight-through, simple open cycle gas turbine direct-connected to a centrifugal type gas booster pump.

The complete unit, with all auxiliaries, is mounted on a single bedplate and is 20 feet long, five feet wide, 4½ feet high, and weighing 26,000 pounds.

Free air enters the compressor at the left, is compressed to approximately five atmospheres, passes into twelve tubular type combustors where either fuel oil or natural gas is injected and burned, and then the heated air and products of combustion are expanded through the turbine, and exhausted to the atmosphere. About 2/3 the output is consumed by the compressor, the remaining 2,000 H.P. being available to drive the gas booster.

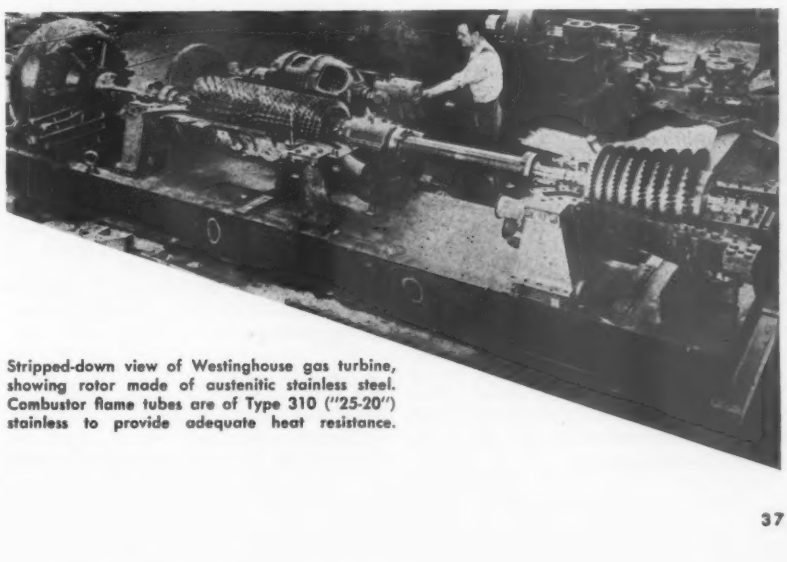
The twelve combustors six inches in diameter and three feet long are located between the air compressor and the turbine so as to provide a minimum of turning of the high velocity gases. Each combustor is interconnected for ignition purposes. The flame tube, or inner basket, is made of "25-20" chromium-nickel alloy steel sheet rolled into circular sections and spot welded together. When in operation, the flame is contained within this inner tube which is perforated to allow air to enter for combustion and necessary cooling. The temperature at the turbine end of the flame tubes and inlet at the turbine is 1350° F at full load.

The gas turbine has eight stages designed for equal heat drops over the stationary and rotating blades. The turbine rotor is machined from a solid forging of stabilized "19-9 DL" austenitic chromium-nickel stainless steel, the main section being 14½" in diameter and 24" long.

The cylinder is also made of stabilized "19-9 DL" austenitic stainless steel, grooved for holding the stationary blading. All bolting is made of stainless steel. These alloys have been chosen as being the best obtainable for the temperature conditions. After 2,000 hours they show no deterioration even though continuously subjected to temperatures in excess of 1300° F for as long as 342 hours.

Since the key to the engine's success is its operating at high temperatures, choice of metals have been a formidable barrier to engineers. Only relatively recently have metals been developed capable of withstanding these high temperatures.

Reprinted from Nickel Topics, March 1950.



Stripped-down view of Westinghouse gas turbine, showing rotor made of austenitic stainless steel. Combustor flame tubes are of Type 310 ("25-20") stainless to provide adequate heat resistance.

Consolidated Edison to end dealer plan

EFFECTIVE JUNE 30, 1950, Consolidated Edison Co. of New York, Inc., intends to terminate its Cooperating Dealer Appliance Plan through which the company has helped dealers to promote the use and sale of gas and electric appliances.

Since 1946 it has been the written policy of the company "to discontinue activities in connection with the direct merchandising of electric and gas appliances as soon as the manufacturers, distributors, and cooperating appliance dealers could, in the opinion of the company, carry on such activities in the best interests of our customers."

Announcement of the change was made by E. F. Jeffe, vice-president in charge of sales, in a letter sent to each of the 1,000 appliance dealers who have taken part in the plan. Mr. Jeffe explained that the management of his company believes "that appliance dealers can now render required services to customers and also that customers have gained an assurance and confidence in dealing with these appliance dealers."

Mr. Jeffe also revealed that the company intends to establish appliance centers where manufacturers may display standard brand appliances. These centers would be available to supply information to both dealers and customers.

Consolidated Edison's appliance promotion bureau will be replaced by a home utilization bureau. This new bureau, as well as the company's sales engineering bureau, will be available to appliance dealers for assistance in promoting the use and sale of gas and electric appliances.

Peoples Natural stops merchandising

THE PEOPLES NATURAL GAS CO., Pittsburgh, Pa., has discontinued the merchandising of gas appliances. The change effective March 1, 1950, was announced by Christy Payne, Jr., vice-president of the company.

Future sales policy in areas served by the utility will be to offer local dealer organizations every possible assistance in the promotion and sale of their own gas appliances. Highlights of the new dealer program are as follows:

(1) That The Peoples Natural Gas Co., after March 1, would not sell gas appliances in competition with dealer organizations.

(2) That the company will support and promote all approved lines of gas appliances handled by dealers, avoiding special company endorsement of any make or line.

(3) That the company will provide full support to all manufacturers of approved gas appliances, and will display all makes of qualified gas appliances, with a fair division of time and space.

(4) That the company will make available to dealers all of the promotional and sales programs produced by the company and by American Gas Association.

Company employees tour A.G.A. Laboratories

CUSTOMER SERVICE DEPARTMENT EMPLOYEES of Southern California Gas Co., Los Angeles, viewed at first-hand the facilities of the Pacific Coast Branch of American Gas Association Laboratories on February 24, 1950. Approximately eighty servicemen took the tour in four groups.

W. H. Vogan, manager of the Pacific Coast Branch, arranged the evening tour so that the servicemen personally could inspect the Laboratories and learn what is required for the A. G. A. Seal of Approval. In addition to the testing requirements, they were shown how, after the controls and appliances are completely tested, they are torn down and blueprinted. The blueprints then are kept on file. If an appliance fails in one part of the test it is put aside until the manufacturer brings it up to the A. G. A. standards. The visitors also examined the Laboratories' own holder for natural gas and the elaborate set-up for making manufactured gas for use in some of the testing.

'50 range, water heater shipments up

SHIPMENTS of gas ranges were 77 percent higher and those of gas water heaters 63 percent higher this January-February than for the same periods a year ago. Preliminary figures obtained from monthly telegraphic reports were compiled and announced recently by Gas Appliance Manufacturers Association. GAMA also released final gas appliance shipment figures for the year 1949.

According to Edward Martin, director of marketing and statistics, GAMA, total shipments for the two-month period were 398,000 units for gas ranges. This compares with 224,400 in 1949, and 451,200 in 1948. The 1936 to 1940 average was 169,500. In January manufacturers delivered 185,000 gas ranges, and in February this total went up to 213,000.

Shipments of gas water heaters were 282,000 units this year compared with 172,900 units in 1949. In January 1950, 128,000 units were shipped and in February, 154,000 units.

Gas-fired boilers—During 1949, according to 14 manufacturers which, for all practical purposes can be regarded as constituting 100 percent of the industry, unit shipments totaled 49,620 units and were 68.6 percent greater than during 1948. During the month of December 1949, unit shipments were 230.1 percent greater than during the same month of the preceding year.

Orders received during December, according to reporting companies, totaled 736 units and were 201.6 percent greater than during December of 1948. At the end of the year, unfilled orders totaled 2,922 units, and were 95.7 percent greater than on December 31, 1948.

The manufacturers' value of the 49,620 gas-fired boilers shipped during 1949 was $15,185,000.

Gas-fired furnaces—Unit shipments of gas-fired furnaces during the month of December 1949, were 113.2 percent greater than during the same month of last year, according to companies approximating 75 percent of the industry's shipments. During the year of 1949, unit shipments were 52.7 percent greater than the preceding year. On this basis, unit shipments expanded to represent the entire industry amounted to 26,500 units in December 1949 and 295,000 units during the year ending December 31, 1949.

Unfilled orders at the end of December 1949, totaled 7,582 units, according to reporting companies.

Reporting companies shipped 221,303 gas-fired furnaces during the year ending December 31, 1949 with the manufacturers' value of these shipments amounting to $37,657,500.

Gas conversion burners—During the month of December 1949, unit shipments of gas conversion burners were 173.2 percent greater than during the same month of the preceding year. According to 18 manufacturers, a total of 181,746 gas conversion burners were shipped during 1949.

Reporting companies indicated that during the month of December 1949, orders received were 799.1 percent greater than during the same month of 1948.

Unfilled orders at the end of December 1949 totaled 3,535 units, an increase of 183.3 percent over the same month of 1948. Manufacturers' value of the 181,746 gas conversion burners shipped during 1949 was $13,297,300.

Domestic gas ranges—During the month of December 1949, unit shipments of domestic gas ranges were 36.9 percent greater than during December of 1948, according to companies approximating 60 percent of the industry's shipments. Unit shipments for the year 1949 were 31.1 percent below 1948, as indicated by reporting companies. Expanding these figures to represent the entire industry, domestic gas range unit shipments for December 1949 amounted to 190,100 units, and 2,061,500 units during the year ending December 31, 1949.

According to reporting companies, unfilled orders totaled 87,477 units on December 31,

1949, an increase of 2.2 percent as compared with the preceding month.

Reporting companies shipped 1,236,915 domestic gas ranges during the year ending December 31, 1949 with the manufacturers' value of these shipments amounting to $112,174,000.

Gas-fired water heaters—During the calendar year 1949, total industry shipments of automatic gas water heaters approximated 1,411,500 units; 164,000 of these were for use with liquefied petroleum gas. These figures represent total industry shipments and are based upon reports received from manufacturers approximating 95 percent of the industry.

During the month of December 1949, unit shipments were 37.0 percent greater than during the same month of 1948. Unfilled orders, according to reporting companies, totaled 57,903 units on December 31, 1949.

Reporting companies also indicated that during the year ending December 31, 1949, unit shipments of automatic gas water heaters totaled 1,340,901. The manufacturers' value of these shipments was $66,837,000.

Gas-fired floor furnaces—December 1949 unit shipments of gas-fired floor furnaces were 16,287 and for the year ending December 31, 1949 were 211,878, according to reporting companies approximating 80 percent of the industry's shipments. Expanding these shipments on this basis to represent the entire industry, December shipments are estimated at 20,400 units and for the year ending December 31, 1949, unit shipments are estimated at 264,800.

During the month of December 1949, orders received totaled 6,271 units and unfilled orders totaled 5,154 units, as indicated by reporting companies.

Gas production research

(Continued from page 9)

easily and accurately controllable temperature ranges, small site areas and greater capacity per unit as compared with conventional water gas sets.

In consideration of the currently available oil gasification processes it is recognized that not enough is known about the effects of the process variables (the kind of oil, the temperature, the contact time and the cracking atmosphere as affected by recirculation of gas) upon the composition and burning characteristics or interchangeability of the gas produced, especially as affecting high Btu oil gas production. These are the reasons for continuing the studies of oil pyrolysis or oil gasification with the laboratory tools and techniques originally developed for evaluating the enrichment values of oils

Just initiated is a project to determine the approximate degree of compatability of the currently produced oil gases with natural gas. These tests should indicate what further research is necessary to develop suitable substitutes for natural gas. It is possible that suitable control of the production processes will be sufficient. Possibly after-treatments with catalysts will provide the answers. Decisions as to the course of the future work must await the results of these preliminary studies.

Work of catalytic reforming is relatively new to the gas industry. The work of this committee has aroused so much interest that by now five continuous catalytic reforming plants have been erected and one manufacturer has developed and announced a cyclic catalytic reforming process. The work on catalysts is being continued with emphasis on a determination of the resistance to sulfur poisoning of the existing nickel catalysts.

We also are investigating new catalysts. International Nickel Company is cooperating on a portion of this program. This work is directed particularly to an investigation of reforming catalysts which are capable of operating in the presence of large amounts of sulfur. Other possible applications will receive later consideration.

Related to catalyst research, the work of one of our special sub-committees should be mentioned. The Methanation Subcommittee has made intensive studies of the vast amount of work being done both here and abroad on the conversion of water gas and similar gases to higher Btu gases by methanation. The Gas Production Research Committee had adopted a policy of watchful waiting in view of the imminence of large-scale operations of this character, such as the Hydrocol Process at Brownsville, Texas.

In the field of coal carbonization a literature survey is being made. Information on actual practice and experience will be collated through plant visits. Following critical review and a study of this material we feel that it will be possible to develop specific research projects in this broad and complicated field.

Spray cooling is another subject under consideration. Greater utilization of spray cooling is of particular interest in conjunction with peak load plants because of the possible savings in capital investment which may be realized by its use in gas transfer pipes.

Finally, in the matter of carbon gasification we are continuing two fundamental research projects which are but two approaches to the same question. At I.G.T. the experimental approach is by means of a continuous or "steady state" of carbon gasification by external heating. The work is aimed at determining what reactions take place at what rates with known temperatures and steam rates.

At Battelle the experimental approach is to use a small water gas generator with the usual cycles of heating and gas making. The object is to find out not only what goes on in a water gas fuel bed but where it goes on. The reactions are very complicated and progress will not be rapid. Findings of this work, together with that of other works, already appear to be developing certain patterns which should lead to a much better understanding of the factors which control the rates and extent of carbon gasification in water gas generators and producers.

It is not possible in this limited space to cover all of the projects in detail but we have endeavored to present a summary of our program, as well as our philosophy. The committee has endeavored to keep fully advised of the needs of the industry, and to direct research along responsive lines. In this research program you will note that practical research is emphasized but that the program includes some fundamental research in what we believe is a reasonable balance.

Note also that some of the projects are aimed at the development of processes or information which will be of value in the very near future. We have also sought to anticipate some of the future needs of the industry and have initiated projects so that the answers may be available when the need arises.

We feel that we have developed a well-rounded program that will be of practical advantage to the gas industry. The committee appreciates the support given through subscription to the PAR Plan. It urges continued support towards the research which is so necessary to insure the progress of the gas industry in the face of strong competition.

Wright named Southern Counties official

FRANK B. WRIGHT was elected vice-president, Southern Counties Gas Co., Los Angeles, at the annual meeting of the board of directors on March 15. Coincident with Mr. Wright's election, President Arthur F. Bridge announced a number of promotions to fill the posts left vacant by personnel moving up the line.

Mr. Wright, who holds the position of manager of the company's Ventura division, succeeds Norman R. McKee, who is slated for retirement on May 1 under the company's uniform pension plan. In his new position, Mr. Wright will have charge of sales, public relations and customer department functions. Except for a break of four years during and immediately following World War I, Mr. Wright has been with Southern Counties since 1916.

Monte M. Temple was appointed to take over Mr. Wright's position as division manager at Ventura on March 20. Mr. Temple, who succeeded B. A. Devine as superintendent of the company's eastern division in 1947, has been with the company since 1935.

George S. Coates, division supervisor of the customers department in the Santa Monica Bay division, was at the same time appointed to the newly-created position of manager of the customers department with headquarters in Los Angeles. He will take over the new assignment on May 15. Mr. Coates joined the company as a collector in 1935.

Thomas N. Banks was appointed to the post of division superintendent of Eastern Division, vacated by Mr. Temple. Ray W. Anderson will take over Mr. Coates' duties as supervisor of the customers department in the Santa Monica office. William C. Bullock was promoted to division supervisor of the customers department in Ventura. G. K. Shick will take over the duties of chief clerk of the Texas pipeline division.

F. B. Wright

G. S. Coates

Seal elected Ebasco vice-president

T. G. SEAL has been elected a vice-president of Ebasco Services Inc., New York, N. Y. John E. Lothian has been named a business consultant for the firm.

Mr. Seal is a director of the company and general consultant for Ebasco's middle south utilities group of client companies, including Arkansas Power & Light Co., Louisiana Power & Light Co., Mississippi Power & Light Company and New Orleans Public Service Inc. He will continue his activities for this group. During the period 1934-1937 he was with the Arkansas Department of Public Utilities as rate engineer and later as Commissioner.

Mr. Seal joined Louisiana Power & Light Company in 1937 as director of rates and research. On Nov. 1, 1940, he became associated with Ebasco Services Inc. as an assistant operating sponsor, becoming successively operating consultant, operating sponsor and general consultant.

Mr. Lothian previously was associated with Industrial Commodity Corp., and Standard Statistics Company. Following release from the army in 1946, he became chief economist in charge of planning and development division, National Broadcasting Company.

Personal and otherwise

Moffats purchase Ontario company

ELEVEN MONTHS following the sale of their interests in the well-known industrial firm founded by their grandfather, three members of the Moffat family announced purchase of Empire Stove and Furnace Company Ltd., Owen Sound, Ontario, Canada. The Empire Co., a modern sheet steel and enamelling plant which was formerly owned by members of the Christie family, has been purchased outright by James M., Bryce F., and Charles L. Moffat.

In addition to the lines being presently manufactured by the Empire Company, the new owners plan on the immediate production of a revolutionary new line of gas and electric commercial cooking equipment which, it is said, will completely out-mode existing models.

Since no Canadian company is now manufacturing a complete line of gas commercial cooking equipment, the entry into this field represents an expansion of this country's list of manufactured steel products.

The three Moffats will assume the following board positions in their new company: B. F. Moffat, chairman of the board; J. M. Moffat, president; C. L. Moffat, vice-president and general manager.

Wuestenfeld made North Shore president

EFFECTIVE APRIL 1, William J. Wuestenfeld was elected president and general manager, North Shore Gas Co., Waukegan, Illinois. He succeeds A. W. Conover who has resigned to accept the presidency of Equitable Gas Company in Pittsburgh. Mr. Conover was honored at a farewell dinner of company employees, directors and officers on March 23.

Mr. Wuestenfeld is a vice-president of North Shore Gas Company and a member of American Gas Association. Prior to moving to the Waukegan area four years ago, he served for many years in executive capacities with gas and electric utility companies in Davenport, Ottumwa, and Muscatine, Iowa.

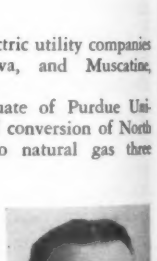
An engineering graduate of Purdue University, he had charge of conversion of North Shore Gas Company to natural gas three years ago.

Rincliffe promoted by Philadelphia Electric

R. G. RINCLIFFE has been elected a director and executive vice president, Philadelphia Electric Co., Philadelphia, Pennsylvania. He succeeds N. E. Funk who retired on February 27, 1950.

Mr. Rincliffe joined the organization in 1923 as an engineering assistant. He progressed through various positions including superintendent of gas manufacturing, purchasing agent, and vice-president in charge of electric operations, the position he has held since 1945. He is a graduate of Massachusetts Institute of Technology with the degree of master of science in chemical engineering, and is a member of numerous national organizations including American Gas Association and Pennsylvania Gas Association.

Mr. Funk has served Philadelphia Electric Company for more than 40 years. He is a graduate of Lehigh University with the degree of doctor of engineering. A national authority on engineering matters, Mr. Funk is a past-president, Philadelphia Engineers Club; a past regional vice-president, American Society of Mechanical Engineers, and an active member of numerous other organizations.



R. G. Rincliffe

Public Service promotes

DONALD C. LUCE has been elected vice-president in charge of combined operations and a director of Public Service Electric and Gas Co., Newark, New Jersey. He succeeds the late Jacob T. Barron.

Mr. Luce joined the company as a cadet engineer in 1924, the same year he graduated from Lehigh University. Prior to his latest advancement he was vice-president in charge of electric operation.

Lass enters retirement

CHARLES A. LASS, valuation engineer on the New York State Public Service Commission, retired from professional service earlier this year. He was a member of American Gas Association for more than 25 years.

A college graduate with a B.S. degree in civil and mining engineering, Mr. Lass joined the engineering staff of Birmingham Electric Co., Birmingham, Ala., in 1912. He then served until 1929 in various posts including gas engineer.

Portland names Clarke

WITH PORTLAND (Ore.) Gas and Coke Company launching a greatly expanded sales program this year, appointment of Allan Clarke as sales promotion manager was announced recently by Vice-President R. G. Barnett.

Mr. Clarke is a graduate of Columbia University where his studies of sales promotion and merchandising were interrupted by service with the U. S. Army. He later joined American Thread Co., New York, as assistant advertising manager, later becoming sales promotion manager.

Cincinnati appointment

C. M. TURNER, formerly with Ebasco Services Inc., New York, N. Y., has become associated with the rate department of The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

Mr. Turner was in charge of the consulting service on rate matters given The Cincinnati Gas & Electric Company by Ebasco Services Inc. during the past three years. He had been associated with the New York firm for 20 years and is currently a member of American Gas Association.

Blood donors honored

General George C. Marshall, national president of the Red Cross, presenting certificate from Greater New York Red Cross Chapters to Gallon Club of Consolidated Edison Co. of New York, Inc. for "giving blood to save lives and alleviate suffering." Receiving the certificate is William Von Werne, chairman of the company Mutual Aid Society's blood bank committee. During the past three years the bank has received more than 4,000 blood donations from and for employees and 30 employees have given eight times or more to qualify for the Gallon Club

Gas measurement short course ready

STREAMLINED CHANGES in the program of the silver anniversary meeting of the 1950 Southwestern Gas Measurement Short Course will give a more balanced and more diversified list of subjects. The course will be held at University of Oklahoma, Norman, Okla., April 11-13, 1950. With the exception of the first morning, general sessions will be discontinued and classroom work will replace talks of a general nature which had been given heretofore.

W. H. Woods, division gas engineer, Gulf Oil Corp., Houston, Texas, will preside as chairman of the general committee. Principal address of the short course will be delivered by J. H. Russell, vice-president, Gulf Oil Corp., Houston.

Purpose of the course is to provide an opportunity for individuals in the industry to study together the common problems pertaining to measurement and regulation of gas.

Students tour Central Hudson gas works

STUDENTS in Newburgh, N. Y., high schools are becoming well acquainted with the Poughkeepsie gas works of Central Hudson Gas & Electric Corporation.

During a recent one-month period, more than 800 Newburgh high school students studied the scientific characteristics of natural gas as well as the techniques of making and distributing manufactured gas. The utility has assisted in this gas study by providing each science student with a portfolio of illustrated charts showing the history, use and science of gas and by preparing a manual on gas for teacher use.

Of special interest to students and teachers during their tour was discussion by gas engineers of the company's $2 million project to bring natural gas from Texas to Mid-Hudson homes and places of business by the end of this summer. The underground origin of natural gas was described as well as the system of carrying it across the continent by means of high-pressure transmission lines. Engineering problems faced by the company in building its 40-mile natural gas transmission line from Tuxedo to Poughkeepsie were also discussed.

Groups of high school students from several other communities also are slated to visit the Poughkeepsie gas works.

New comic booklets to promote safety

EBASCO SERVICES INC., New York, N. Y., has issued the first of a series of comic booklets dealing with safety in connection with the general public and utilities.

The booklets are calculated to help reduce injuries and loss of human life. As a corollary, by reducing damages to the companies' operating systems and by cutting the public's accident and damage claims against the companies, the resultant costs will be lowered.

While the major subject is safety, a section is devoted to demonstrating the advantages and superiorities of the American way of life.

Each booklet is 16 pages long and printed in four colors. "Script" and artwork are by the same writer and artist who prepare the popular "Captain Marvel" comics.

The booklets are designed to fill a long-felt need in the field of public safety directly affecting the utility industry. Many sociologists, psychologists and educators agree that the comic book is a particularly effective medium for reaching mass audiences in educational efforts.

Associated organization activities

NEGA meeting shows expansion picture

A VIGOROUS and optimistic picture of gas industry expansion in the Northeast was painted by speakers at the annual business conference of the New England Gas Association March 23-24 at the Hotel Statler in Boston. More than 500 delegates attended the meeting which featured a comprehensive program on topics of industrywide concern.

John A. Hiller, sales manager, Portland Gas Light Co., Portland, Me., was elected president of the association. Other officers were elected as follows: first vice-president—Gordon G. Howie, Cambridge Gas Light Co.; second vice-president—Sherman R. Knapp, The Connecticut Light & Power Co.; treasurer—Otto Price, Boston Consolidated Gas Co., and executive secretary—Clark Belden.

New division chairmen were named as follows: Accounting—A. E. Donehey, Boston; Industrial—Ford R. Waugh, Boston; Manufacturers—William F. Marsh, Boston; Operating—E. F. Kennedy, Malden, and Sales—Norman R. Miller, Boston.

Growth of the New England Gas Association was emphasized by Clark Belden who opened the conference with a review of the year's high points. NEGA now has 285 company members, a net gain of 74 companies or 35 percent above the membership of 28 months ago, Mr. Belden reported.

At the same session, E. H. Eacker, NEGA president and president, Boston Consolidated Gas Co., reviewed the history of regional and national organizations serving the gas industry. "We have the finest of New England and national trade organizations," he concluded.

Speaking on "Gas Uses Unlimited," S. H. Hobson, president, Gas Appliance Manufacturers Association, predicted expansion of 1950 sales efforts "in amounts approaching 50 percent." Gas appliance sales for this year are expected to advance 20 to 30 percent, Mr. Hobson said. Pointing out that gas companies' sales objectives become the basis for manufacturers' quotas, he asked each utility to set its targets clearly and plan its program ahead.

D. A. Hulcy, first vice-president, American Gas Association, and president, Lone Star Gas Co., Dallas, Texas, closed the first session with a stimulating address entitled "A Green Light for the Blue Flame." "Never before in its long history has the gas industry faced greater promise for the future," Mr. Hulcy declared. He backed up this statement by describing advances made under the A. G. A.'s PAR Plan and other farsighted activities.

Anticipating the advent of natural gas in New England, Mr. Hulcy cautioned his audience not to look upon this event as a cure-all for problems of rates and service. Load factors, costs, and economic factors must be solved, but, he added, "natural gas never went anywhere without doing a lot of people a lot of good."

Mr. Hulcy called attention to the vast reserves of natural gas, pointing out that new discoveries and extensions have been consistently greater than twice the nation's annual production of natural gas. Expansion of natural gas service, he noted, has changed the character of the gas business. In 1939, for example, with more than 17 million gas customers, 49 percent received straight manufactured gas service. Ten years later, in 1949 with more than 23 million customers, those receiving manufactured gas had shrunk to 35 percent while those getting natural and mixed gas had jumped from 51 to 63 percent.

Supplementing Mr. Hulcy's remarks, PAR research and promotion progress was described respectively by R. J. Rutherford, president, Worcester Gas Light Co., and chairman, A. G. A. Committee on Domestic Gas Research; and by J. J. Quinn, vice-president, Boston Consolidated Gas Company. Mr. Quinn presented a paper by Frank C. Smith, president, Houston Natural Gas Corp. and chairman, A. G. A. General Promotional Planning Committee. Adaption of A. G. A. research principles has been accelerated by appliance manufacturers, Mr. Rutherford stated, and will be reflected increasingly in future gas equipment. He estimated that $10 is spent by the manufacturers as a group as a result of the expenditure of each PAR research dollar.

Cooperative, integrated promotion of the various gas industry elements is necessary to match the enormous capital of individual electric appliance manufacturers, Mr. Smith's paper stated. A. G. A. strategy under the PAR Plan is to plan and implement a full calendar of seasonal promotions on all uses of gas, and to consolidate all units of the industry. The part regional associations can play in making the program effective at the grass roots level was stressed.

Other speakers who gave pertinent advice on gas promotional opportunities were Roy E. Wright, director of gas sales, NEGEA Service Corp.; W. Paul Jones, president, Servel, Inc.; and R. Louis Towne, sales promotion manager, Rheem Manufacturing Co., and chairman, GAMA Water Heating Promotion Committee.

Mr. Wright described factors required to secure the new home market. Mr. Jones urged the industry to devote more attention to creating new sales outlets. The market for gas refrigeration, he said, is unlimited and his company's immediate objective is to sell 500,000 more gas refrigerators per year. Mr. Towne threw the spotlight on the plumber-dealer who, he indicated, must be given a more conspicuous role in the industry's promotional efforts.

Further aspects of the planned extension of natural gas to New England were covered by Howard B. Noyes, vice-president, Washington Gas Light Co., and Robert E. Ginna, vice-president, Rochester Gas and Electric Corporation. Mr. Noyes gave valuable information on the public relations phase of conversion to natural gas. Mr. Ginna spoke of rate and other problems, citing the pitfalls revealed by past experience. Among these were: the tremendous responsibility involved

1950-51 officers of New England Gas Association in Boston, Massachusetts: (Front row, left to right) John A. Hiller, Portland Gas Light Co., incoming president; E. H. Eacker, Boston Consolidated Gas Co., retiring president; Gordon G. Howie, Cambridge Gas Light Co., first vice-president; (rear row) Sherman R. Knapp, The Connecticut Light & Power Co., second vice-president; Otto Price, Boston Consolidated Gas Co., treasurer, and Clark Belden, executive secretary, clerk

in adopting rates that might attract a mass heating market; cost of peak load standby facilities; varying characteristics of natural as compared with manufactured gas; necessity to make natural gas available to all customers; immediate need for adoption of therm basis of rates; and realization that cold waves move from west to east with consequent effect on supplies of natural gas.

P. T. Dashiell, consultant, United Engineers and Constructors, Inc., Philadelphia, and former chairman, A. G. A. Gas Production Research Committee, presented an able review of new gas production processes. Discussing these processes in relation to the availability of natural gas, he expressed the opinion that no type of oil gas now made is completely interchangeable in a burner which has been properly adjusted to burn natural gas. Enrichment of manufactured gas with natural gas to raise the calorific value to 650 Btu is a sound procedure and should prove economical, Mr. Dashiell stated.

Rounding out the business program were addresses by T. H. Sanders, Harvard University, on corporate accounting; James C. Olson, New York, on marketing research; Harold H. Young, Eastman, Dillon & Co., on gas company financing; and Thomas M. Joyce, Massachusetts Electric and Gas Association, on the challenge to the free enterprise system.

The home service group meeting was held simultaneously with the final NEGA conference session. Ella A. Heyne, Northampton Gas Light Co., was elected chairman of the NEGA Home Service Committee for 1950-1951. H. Dorothy Keller, Blackstone Valley Gas and Electric Co., was named vice-chairman, and Mrs. Gertrude M. Crosthwaite, The Connecticut Light and Power Co. was appointed secretary-treasurer. Principal speaker at this meeting was Irene Muntz, chairman, A. G. A. Home Service Committee, and home service director, Rochester Gas and Electric Corporation. Her topic was "Keeping Up with the Homemaker."

GAMA to convene in White Sulphur Springs

THE ANNUAL MEETING of Gas Appliance Manufacturers Association will be held May 28-30 at The Greenbrier, White Sulphur Springs, West Virginia. H. Leigh Whitelaw, managing director, announced that the program will be designed to promote the new era of aggressive selling in the gas industry.

Morning sessions will include various meetings of GAMA's product divisions. A two-hour luncheon and general session will be held each day. In the afternoon, division meetings will be continued when necessary and the remainder of the time will be used for personal conferences. A dinner will be held each evening with guest speakers and entertainment.

Once again a resort hotel has been selected for the annual meeting in order that there would be greater opportunity for both formal and informal industry conferences plus recreation facilities.

Aside from normal business the election of officers will be held on May 28 at the noon general session.

Large attendance forecast for Indiana

AN ATTENDANCE of approximately 300 persons is expected for the fortieth annual convention of Indiana Gas Association according to President A. E. Hatley of Muncie. The two-day sessions will be held April 27-28 at French Lick, Indiana.

According to the tentative program, highlight of the morning session on opening day will be an address by Paul Taylor, vice-president, Stone & Webster Service Corp., New York, on "Hydrocarbons, Unlimited." Other speakers scheduled include George Saas, president, G. A. Saas Advertising Co., Indianapolis, and Ed Dowling, retired Indianapolis businessman who returned recently from Russia.

Paul Jones, president and general manager, Servel, Inc., Evansville, Ind., will speak Friday, April 28, on "The Significant Trend of Business Morals." H. Carl Wolf, managing director, American Gas Association, will talk on "Marching Forward Together." Lyle C. Harvey, president, Affiliated Gas Equipment, Inc., Cleveland, and Dr. Harry Sauvain, Indiana University economist, will address the delegates. An election of officers will conclude the meeting Friday noon.

OBITUARY

John Van Norden

John Van Norden

secretary and sales promotion manager of American Meter Co., New York, N. Y., died March 18 at New York Hospital. He was a director of American Gas Association; treasurer and a director of Gas Appliance Manufacturers Association, and a founder member of the Society of Gas Operators.

Mr. Van Norden, a native of the Netherlands, was brought to the United States as a child. He entered Yale University with the class of 1918 but subsequently joined the Army in World War I. In 1920 he was graduated from Hamilton College.

Before joining American Meter Company in 1928 he served as a partner in Hal-Nord Newspaper Feature Service and in the advertising department of McGraw-Hill Publishing Company.

He was a member of Liquefied Petroleum Gas Association, New Jersey Gas Association, Southern Gas Association, and clerk of the Gild of Ancient Supplers.

Surviving are his wife, Mrs. Marion McDonald Van Norden; a daughter, Mrs. Archibald McClure of Memphis, Tenn., and a son, John D. Van Norden, a student at Yale University.

Jacob T. Barron

a vice-president and director, Public Service Electric & Gas Co., Newark, N. J., died in a hospital at Elizabeth, N. J. on March 12.

Mr. Barron had been associated with the New Jersey utility since 1907, advancing rapidly to different positions of responsibility. Since 1948 he had been vice-president in charge of combined operations, encompassing gas, electric and transportation services.

He was a member of American Gas Association and a director of Edison Electric Institute.

Surviving are his wife, Mrs. Ethel Brewerton Barron; two sons, Henry B. and Jacob T. Barron Jr.; a daughter, Mrs. Elena B. de Raismes, and two sisters, Mrs. Samuel F. Ervin and Mrs. Edwin O. DePass.

Paul L. G. Hasskarl

safety engineer for Pennsylvania Power & Light Company's statewide system since 1926, died February 22 in Allentown Hospital at the age of 62. At the time of his death, he was chairman of the Accident Prevention Committee, American Gas Association and a member of similar committees for Edison Electric Institute and Pennsylvania Electric Association.

Widely known for his safety work with the utility company, Mr. Hasskarl was twice president of Lehigh Valley Safety Council and his ability was recognized by national safety organizations. He was also a former general chairman of National Safety Council's public utilities section.

Mr. Hasskarl is survived by his wife, his daughter, Mrs. Albert M. Hinkel of Allentown; his grandson, McCord Hinkel; also a brother, Victor of Mechanicsburg, Pa.; and three sisters, Mrs. Bessie Soonborn, Mrs. Grace Flottman, both of Philadelphia, and Mrs. Sophia March in Tokyo, Japan.

(a) CRUDE OIL—AMERICAN PETROLEUM INSTITUTE

	(BARRELS OF 42 U. S. GALLONS)	
Total proved reserves of crude oil as of December 31, 1948		23,280,444,000
Revisions of previous estimates	+603,566,000	
Extensions of old pools	1,693,862,000	
New reserves discovered in 1949 in new fields and in new pools in old fields	890,417,000	
Proved reserves added in 1949		3,187,845,000
Total proved reserves as of December 31, 1948 plus new proved reserves added in 1949		26,468,289,000
Less production during 1949*		1,818,800,000
Total proved reserves of crude oil as of December 31, 1949		24,649,489,000
Increase in crude oil reserves during 1949		1,369,045,000

(b) NATURAL GAS LIQUIDS—A. G. A. and API

	(BARRELS OF 42 U. S. GALLONS)	
Total proved reserves of natural gas liquids as of December 31, 1948		3,540,783,000
Revisions of previous estimates and extensions of old pools	+294,211,000	
New reserves discovered in 1949 in new fields and in new pools in old fields	92,565,000	
Proved reserves added in 1949		386,776,000
Total proved reserves as of December 31, 1948 plus new proved reserves added in 1949		3,927,559,000
Less production during 1949*		198,547,000
Total proved reserves of natural gas liquids as of December 31, 1949		3,729,012,000
Increase in Natural Gas Liquids reserves during 1949		188,229,000

(c) TOTAL LIQUID HYDROCARBONS—API and A. G. A.

	(BARRELS OF 42 U. S. GALLONS)	
Total proved reserves as of December 31, 1948		26,821,227,000
Revisions of previous estimates and extensions of old pools	+2,591,639,000	
New reserves discovered in 1949 in new fields and in new pools in old fields	982,982,000	
Proved reserves added in 1949		3,574,621,000
Total proved reserves as of December 31, 1948 plus new proved reserves added in 1949		30,395,848,000
Less production during 1949*		2,017,347,000
Total proved reserves of liquid hydrocarbons as of December 31, 1949		28,378,501,000
Increase in Total Liquid Hydrocarbon reserves during 1949		1,557,274,000

* The 1949 production figures were compiled by the committee and where necessary are based on 11 months actual production with an estimate for December. Any variance between the actual production, as later reported, and the figures used herein will be compensated for through revision when the following year's reserve report is compiled. These revisions have in the past been very small.

Natural gas reserves

(Continued from page 6)

in any pool, include the oil estimated to be recoverable by the production systems now in operation, whether primary or secondary, and from the area actually drilled up on the spacing pattern in vogue in that pool. The proved undrilled reserves, in any pool, include reserves under undrilled spacing units which are so close, and so related, to the drilled units that there is every reasonable probability that they will produce when drilled.

In the case of new discoveries, both of new fields and of new pools (pays, reservoirs) in old fields, which are seldom fully developed in the first year and in fact for several years thereafter, the estimates of proved reserves necessarily represent but a part of the reserves which may ultimately be assigned to the new reservoirs discovered each year. For a one-well field, where development has not yet gone beyond the discovery well, the area assigned as proved is usually small in regions of complex geological conditions but may be larger where the geology is relatively simple. In a sparsely drilled pool the area between wells is considered to be proved only if the geological and engineering data assure that such area will produce when drilled.

The total of new oil through discoveries estimated as proved in any given year is generally comparatively small, because development is usually not extensive during the first year. The total of new oil through extensions, on the other hand, is comparatively large. As knowledge of the factors affecting production and reservoir performance becomes available, and as these factors are studied, reserves in older fields can be estimated with greater precision and revised accordingly. Therefore, the total quantity of the new proved reserves for the year includes the oil from discoveries, extensions and revisions of previous estimates.

The committee again stresses the fact that its estimates of proved reserves cannot be used in measuring the rate at which these reserves can be produced with or without physical waste. Oil cannot be produced from the permeable rocks in which it occurs at any desired rate, because the flow of oil through the pores of the oil-bearing rocks is definitely controlled by the physical factors of the reservoir. As a matter of fact, today's known oil can be recovered only over a period of many years and at gradually declining annual rates. This has been widely demonstrated by past performance under all kinds of operating conditions. Therefore, only incorrect conclusions as to the life of these reserves can be obtained by dividing these reserves by the current rate of production.

As in the past, the committee emphasizes the fact that every effort has been made again to secure a fair, unprejudiced, and representative opinion. Each member in his district appointed a number of subcommittees to gather and study the necessary data. All previously determined factors pertaining to the various pools were examined and adjusted in the light of new information. The subcommittees which were largely responsible for the data, were comprised of geologists and petroleum engineers with long experience in this class of work. We wish to acknowledge the valuable assistance of all those who have cooperated in this undertaking.

(See Table 3 at the right)

Gas conversions

(Continued from page 18)

lar part of the story, additional textual qualifications are needed to present a true picture.

In most cases, rate reductions on a therm basis accompanied the changeovers which were included in this survey. However, the timing, nature and extent of such rate changes for each class of business varied considerably in individual cases. As might be expected, the prewar rate changes incident to such conversions were generally more substantial than those since the war. Price changes as a result of changeover from manufactured to natural gas also tended to be greater than price changes for other types of conversion.

Numerous instances were reported of ten-fold increases in the number of residential house heating customers within one year after conversion from manufactured to natural gas. It should be remembered, however, that many of these companies, particularly those which converted during the early 1930's, had very few heating customers prior to their changeover. Furthermore, it would be pertinent to look at the experience of comparable companies which did not convert, not only with respect to house heating trends but also the other items shown in the tables. Some of these items do not show equally spectacular trends when compared with house heating but they actually may be more encouraging when compared with companies which did not convert.

Trends revealed in the survey were developed as unweighted composite indices with the last year prior to each conversion listed as 100. This procedure helps to guard the identity of individual companies and assures that the results are not overbalanced by the experience of a few large companies. For similar reasons, only the changeovers from manufactured and mixed gas to natural gas are shown in the tables on page 18.

It was considered likely that customer, consumption and revenue trends also would be influenced by the general economic status during the period when individual changeover projects were undertaken. Consequently the data for one, two and five years after conversion were segregated into three periods—namely, prewar (1932-1941), wartime (1942-1945) and postwar (1946-1949). All of the conversions from mixed to natural gas included in this study occurred during the latter period.

Some interesting facts are indicated by the composite trends, after making proper reservations regarding the statistical completeness of the data. Despite spectacular increases in house heating customers—as much as 50-fold within five years—the greatest proportionate increases in sales and revenues, by customer classifications, occurred within the commercial and industrial categories. It is not too surprising to find that the rate of growth of domestic house heating for those companies which converted during the war was more moderate than for the prewar period. However, it is somewhat surprising, in view of gas and materials shortages but not of the competitive price situation, to find the postwar conversions reporting nine and fourteen-fold increases in house heating customers within one and two years, respectively.

Of interest to operating personnel are reported trends in maximum daily sendouts showing that the increases in terms of therms have averaged at least 150 percent within two years and 315 percent within five years. Even based on cubic foot volumes, sendout increases have been at least 35 percent within two years and 160 percent within five years after conversion from manufactured gas to natural gas.

Summing up, this composite experience suggests the probability of substantial increases in sales to all classes of consumers with accompanying but more modest increases in operating revenues for companies which are considering conversions within the near future.

TABLE 3 SUMMARY OF ANNUAL ESTIMATES OF NATURAL GAS RESERVES DEC. 31, 1945 TO DEC. 31, 1949

(MILLIONS OF CUBIC FEET—14.65 PSIA, AT 60 DEG F)

	NATURAL GAS ADDED DURING YEAR						
	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Total of Discoveries, Revisions and Extensions	Net Change in Storage	Net Production During Year	Estimated Proved Reserves as of End of Year	Increase over Previous Year
45	—	—	—	—	—	147,789,367	—
46	*	*	17,729,152	*	4,942,617	160,575,901	12,786,535
47	7,570,654	3,410,170	10,980,824	*	5,629,811	165,926,914	5,351,013
48	9,769,483	4,129,089	13,898,572	51,482	6,007,628	173,869,340	7,942,426
49	8,061,429	4,612,870	12,674,299	82,746	6,245,041	180,381,344	6,512,004

*Not Estimated.

TABLE 4 SUMMARY OF ANNUAL ESTIMATES OF NATURAL GAS LIQUIDS RESERVES DEC. 31, 1946 TO DEC. 31, 1949

(THOUSANDS OF BARRELS OF 42 U. S. GALLONS)

	NATURAL GAS LIQUIDS ADDED DURING YEAR					
	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Total of Discoveries, Revisions and Extensions	Net Production During Year	Estimated Proved Reserves as of End of Year	Increase over Previous Year
46	—	—	—	129,262	3,163,219	—
47	192,237	59,301	251,538	160,782	3,253,975	90,756
48	405,874	64,683	470,557	183,749	3,540,783	286,808
49	294,211	92,565	386,776	198,547	3,729,012	188,229

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Natural gas

● The rocketing expansion of the natural gas industry has been a commercial phenomenon of the postwar era.

● Natural gas is coveted because it is clean, cheap and constant in its heating ability. Of these three graces the greatest is number 2.

● The word "phenomenal" is not too strong to apply to the natural gas industry.

—Cleveland Plain Dealer

CONVENTION CALENDAR

1950

APRIL

3-5 •A. G. A. Distribution, Motor Vehicle & Corrosion Conference, Book Cadillac Hotel, Detroit, Mich.
4-6 •A. G. A. Sales Conference, Industrial & Commercial Gas Section, Chase Hotel, St. Louis, Mo.
10-12 •Mid-West Gas Association, Hotel Lowry, St. Paul, Minn.
11-13 •Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla.
17-18 •A. G. A. Eastern Natural Gas Regional Sales Conference, Hotel William Penn, Pittsburgh, Pa.
17-19 •National Conference of Electric and Gas Utility Accountants, Brown Hotel, Louisville, Ky.
20-22 •Florida-Georgia Gas Association, annual convention, Biltmore Hotel, Palm Beach, Fla.
25-26 •A. G. A. Domestic Gas Research and Utilization Conference, Hotel Statler, Cleveland, Ohio
27-28 •Indiana Gas Association, French Lick Springs Hotel, French Lick, Ind.

MAY

1-5 •A. G. A. Commercial Gas School, Hotel Gibson, Cincinnati, Ohio
3 •Missouri Association of Public Utilities, Joplin, Mo.
3 •New Jersey Gas Association, Home Service Workshop, Robert Treat Hotel, Newark, N. J.
4-5 •Oklahoma Utilities Association, annual meeting, Biltmore Hotel, Oklahoma City, Okla.
8-9 •A. G. A. Natural Gas Department, Spring Meeting, Mayo Hotel, Tulsa
8-11 •Liquefied Petroleum Gas Association, annual convention and tradeshow, Palmer House, Chicago, Ill.
8-12 •American Foundryman's Association, Cleveland, Ohio (A. G. A. will exhibit).
11-12 •Annual Convention, P.U.A.A., Kansas City, Mo.
16-18 •Pennsylvania Gas Association, Galen Hall, Wernersville, Pa.
18-19 •Wisconsin Utilities Association, Home Service Workshop, Milwaukee, Wisc.
22-24 •A. G. A. Production and Chemical Conference, Hotel New Yorker, N. Y.
23-26 •National Restaurant Association, Navy Pier, Chicago, Ill. (A. G. A. will exhibit)
25-26 •The Natural Gas and Petroleum Association of Canada, annual convention, Prince Edward Hotel, Windsor, Ontario
28-30 •GAMA annual meeting, Greenbrier, White Sulphur Springs, W. Va.
29-31 •Fifth Annual Short Course in Gas Technology, Texas College of Arts and Industries, Kingsville, Texas

Personnel service

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Editor: Experienced writer (edit, rewrite, news, personals, markets, financial and corporate). Knowledge of layout and make-up. Proofreading and giving final O.K. Typist. College graduate capable of turning excellent background and training to good account in any worth-while endeavor. Industrious, animated, personable. Opportunity more important than remuneration. **1644.**

Appliance Sales Manager—successful background of appliance sales to customers and dealers. For the past twenty years directed retail and wholesale utility sales organization. Experience includes all phases of sales training—conducting sales meetings—assisting dealers—working with salesmen, etc. Desires position with manufacturer greater New York and Long Island. **1645.**

Well known new business **Manager** and **Utilization Engineer** returning from overseas Army assignment. Twenty years' of outstanding results in customer relations has been followed by eight years' of duty as world-wide intelligence specialist and military governor with superior ratings. Assumes responsibility and authority easily and combines them with judgment. **1646.**

Editor and **Production Man** employed for thirteen years by large company. Edited and produced house organ and advertising, layout and most of the writing. Experience in writing press releases and radio spots. Desires position with employee or trade association publication, or in public information field. Married. Law School graduate. (34) **1647.**

POSITIONS OPEN

Junior Commercial Sales **Engineer** for gas utility in Southeast soon converting to natural gas. Excellent opportunity for young sales engineer. Give education and experience, age and marital status. Enclose small photo. Advise salary expected. **0576.**

Junior Heating Engineer—Gas utility soon converting to natural gas. Location in southeast. Excellent opportunity for young engineer. State age and marital status together with outline of education and experience, include small photo. Advise expected salary. **0577.**

Engineer—Experienced in residential, commercial and industrial **gas surveys** with ability to prepare economic reports on new distribution systems. Reports and surveys to be used in financing feasible projects. Only those with technical education and experience need apply. Location in South Central United States with established consulting firm. Write stating personal history, previous experience, references and salary expected. **0578.**

California utility wants **Assistant** to **Chief Accountant.** Experience, general accounting (utility desirable). Supervisory experience, I.B.M. activities. Write giving full particulars. **0579.**

Nation-wide consulting firm has vacancy for a **Gas Engineer** with minimum of 8-10 years experience in the production, transmission and distribution of natural and/or manufactured gas. Location: New York City. Some travel involved. Reply giving details of experience and education. **0580.**

Gas industry standards

(Continued from page 33)

early date. This will make it possible to have approved units available for the next heating season and will enable manufacturers to have such tests conducted in the course of regular approval testing.

Provision is made for testing of units for either alcove or closet type installations. The manufacturer may select which type of approval is desired. Choice includes wall clearances of zero, one, two, three or six inches, and whether on combustible or non-combustible floors. Type of installation, clearances and type of flooring must be shown as a permanent marking on the unit. The accompanying exhibit, taken from the requirements, shows the two types of approval and the designations specified for showing various clearances from walls, ceilings and floors.

Units will be tested in operation in a test enclosure and temperature rise on combustible surfaces must not exceed 90 degrees above inlet air temperature to the appliance. Floor temperature will be waived in the case of noncombustible floors. Other tests cover venting, including combustion under blocked flue and downdraft conditions, and cycling under various conditions. Specific combustion and ventilating air openings are also specified in accordance with unit size. Requirements also specify types of electrical conductors, controls and other components which will be approved. Such details were worked out with Underwriters Laboratories.

Revisions made in requirements for other types of appliances and accessories applied to those for water heaters, installation of gas equipment in large boilers, room heaters, semi-rigid tubing and fittings, and incinerators. Revisions were also made in high altitude requirements covering all classes of appliances.

Extensive revisions were made in the case of water heaters and the installation of gas equipment in large boilers. The water heater revisions and additions will require the consolidation of present and revised requirements into a new text to be published as soon as possible. The recommended revisions distributed for criticism in April and August of 1949 were adopted with some modifications. They include various supplementary utility requirements details on which agreement had been achieved. The requirements for large boilers likewise will require the publication of a new text. Revisions made bring the new standard in line with latest developments. The new printing will be pocket-sized.

Provisions for testing of appliances for approval for high altitude use were slightly modified to base the tests on an elevation of 5,000 feet above sea level rather than 5,200 feet as at present. This involves operating an appliance for test purposes at sea level at 25 percent above the high altitude rating desired instead of at 26 percent above this rating. On the other hand, if a reduction in rating for high altitude is elected without test, a value of 80 percent of sea level rating will be employed. The change eliminates odd input values resulting from the former procedure. Suitable modifications were also authorized in various sets of approval requirements containing provisions covering high altitude to conform to the changes described.

To provide further conformity with these changes, approval was given to revising the footnote in the Directory of Approved Gas Appliances and Listed Accessories for reducing sea level ratings shown to high altitude values. A four percent derating for each 1,000 feet elevation above sea level will now be specified instead of five percent.

Requirements that have not been revised during the last three years were reaffirmed by the committee. This action complies with American Standards Association policy of either amending, reaffirming or withdrawing such standards at three-year intervals. Standards reaffirmed were those for refrigerators, duct furnaces, draft hoods, relief and automatic shut-off valves for water heating systems, thermostats, attachable water heating units, furnace temperature limit controls and fan controls, appliance connectors of flexible metal tubing and fittings, and gum protective devices.

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